

NOSC TD 1209  
Volume 1

(4)

NOSC TD 1209  
Volume 1

**NOSC**

NAVAL OCEAN SYSTEMS CENTER San Diego, California 92152-5000

DTIC FILE COPY

**Technical Document 1209**  
**Volume 1**  
**January 1988**

# **Antenna Heights for the Optimum Utilization of the Oceanic Evaporation Duct**

**Part I: Results from the Pacific Measurements**  
**Part II: Results from the Key West Measurements**

J. H. Richter  
H. V. Hitney

**AD-A192 358**



**DTIC**  
**ELECTE**  
**MAR 25 1988**  
**S H D**

Approved for public release; distribution is unlimited.

88 3 23 07 4

**Best  
Available  
Copy**

# **NAVAL OCEAN SYSTEMS CENTER**

**San Diego, California 92152-5000**

---

**E. G. SCHWEIZER, CAPT, USN**  
Commander

**R. M. HILLYER**  
Technical Director

## **ADMINISTRATIVE INFORMATION**

This reissue of Naval Electronics Laboratory Center (NELC) Technical Notes 2031, 2371, and 2569 was funded by the Office of Naval Technology, Arlington, VA 22217. The authors are currently members of the Marine Sciences and Technology Department, Naval Ocean Systems Center, San Diego, CA 92152-5000.

Released by  
H.V. Hitney, Head  
Tropospheric Branch

Under authority of  
J.H. Richter, Head  
Ocean and Atmospheric  
Sciences Division

UNCLASSIFIED  
SECURITY CLASSIFICATION OF THIS PAGE

| REPORT DOCUMENTATION PAGE  |  |   |                                      |  |
|--|--|---|--------------------------------------|--|
| 1a. REPORT SECURITY CLASSIFICATION<br><b>UNCLASSIFIED</b>  |  | 1b. RESTRICTIVE MARKINGS  |                                      |  |
| 2a. SECURITY CLASSIFICATION AUTHORITY  |  | 3. DISTRIBUTION/AVAILABILITY OF REPORT  |                                      |  |
| 2b. DECLASSIFICATION/DOWNGRADING SCHEDULE  |  | Approved for public release; distribution is unlimited.                           |                                      |  |
| 4. PERFORMING ORGANIZATION REPORT NUMBER(S)<br><b>NOSC TD 1209, Vol. 1</b>   |  | 5. MONITORING ORGANIZATION REPORT NUMBER(S)                                       |                                      |  |
| 6a. NAME OF PERFORMING ORGANIZATION<br><b>Naval Ocean Systems Center</b>   | 6b. OFFICE SYMBOL<br>(if applicable)<br><b>Code 54</b> | 7a. NAME OF MONITORING ORGANIZATION   |                                      |  |
| 6c. ADDRESS (City, State and ZIP Code)<br><b>San Diego, CA 92152-5000</b>  |  | 7b. ADDRESS (City, State and ZIP Code)  |                                      |  |
| 8a. NAME OF FUNDING/SPONSORING ORGANIZATION<br><b>Office of Naval Technology<br/>Office of Chief of Naval Research</b>   | 8b. OFFICE SYMBOL<br>(if applicable)                   | 9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER                                   |                                      |  |
| 9c. ADDRESS (City, State and ZIP Code)<br><b>Arlington, VA 22217</b>   |  | 10. SOURCE OF FUNDING NUMBERS   |                                      |  |
|  |  | PROGRAM ELEMENT NO<br><b>62435N</b>   | PROJECT NO<br><b>N01A</b>            | TASK NO<br><b>RA35G80/<br/>RU35G80</b>     |
|  |  |   |                                      | AGENCY<br>ACCESSION NO<br><b>DN888 715</b> |
| 11. TITLE (and Subtitle) (Include Security Classification)<br><b>ANTENNA HEIGHTS FOR THE OPTIMUM UTILIZATION OF THE OCEANIC EVAPORATION DUCT</b><br>Part I: Results from the Pacific Measurements<br>Part II: Results from the Key West Measurements   |  |   |                                      |  |
| 12. PERSONAL AUTHOR(S)<br><b>J.H. Richter and H.V. Hltney</b>  |  |   |                                      |  |
| 13a. TYPE OF REPORT  | 13b. TIME COVERED<br>FROM _____ TO _____               | 14. DATE OF REPORT (Year, Month, Day)<br><b>January 1988</b>                      |                                      | 15. PAGE COUNT<br><b>222</b>               |
| 16. SUPPLEMENTARY NOTATION<br>Volume 1 of 2, first published as informal working documents with limited distribution, (NELC Technical Notes 2031 and 2371), has been reissued as a formal NOSC Technical Document approved for unlimited distribution.   |  |   |                                      |  |
| 17. COSATI CODES   |  | 18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number) |                                      |  |
| FIELD  | GROUP  | SUB-GROUP   |                                      |  |
|  |  | Evaporation ducting   |                                      |  |
|  |  | Propagation   |                                      |  |
| 19. ABSTRACT (Continue on reverse if necessary and identify by block number)<br><br>Extensive evaporation ducting measurements were conducted over a period of 1 year in the Southern California off-shore area and for 2 weeks between Key West and the Marquesas Keys. The purpose of the measurements was to provide data for model validations and to determine if existing climatologies could be used for estimating the probability of occurrence for evaporation ducting conditions. |  |   |                                      |  |
| 20. DISTRIBUTION/AVAILABILITY OF ABSTRACT<br><input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> OTC USERS  |  | 21. ABSTRACT SECURITY CLASSIFICATION<br><b>UNCLASSIFIED</b>                       |                                      |  |
| 22a. NAME OF RESPONSIBLE INDIVIDUAL<br><b>J.H. Richter</b>   |  | 22b. TELEPHONE (include Area Code)<br><b>(619) 553-3053</b>                       | 22c. OFFICE SYMBOL<br><b>Code 54</b> |  |

DD FORM 1473, 84 JAN

33 APR EDITION MAY BE USED UNTIL EXHAUSTED  
ALL OTHER EDITIONS ARE OBSOLETE

UNCLASSIFIED  
SECURITY CLASSIFICATION OF THIS PAGE

## **FOREWORD**

In the early 1970s, a series of extensive evaporation ducting measurements was conducted in different ocean areas. The purpose of the measurements was to provide data for model validations and to determine if existing climatologies could be used for estimating the probability of occurrence for evaporation ducting conditions. Both objectives were successfully met and documented in Naval Electronics Laboratory Center (NELC) Technical Notes 2031, 2371, and 2569. (NELC was a predecessor of the Naval Ocean Systems Center.)

Technical Notes carry a limited distribution statement and cannot be referenced in documents approved for unlimited distribution. Because the information in Technical Notes 2031, 2371, and 2569 is still extensively used, the Technical Notes have been reissued in this NOSC Technical Document approved for unlimited distribution. As a formal, Center-approved publication, this Technical Document can be referenced.

This reissue is presented in two volumes. Volume 1 presents Part 1: Results from the Pacific Measurements (formerly NELC TN 2031) and Part II: Results from the Key West Measurements (formerly NELC TN 2371). Volume 2 presents Part III: Results from the Mediterranean Measurements (formerly NELC TN 2569).

## Part I: Results from the Pacific Measurements

# CONTENTS

|  | <u>PAGE</u> |
|--|-------------|
| SUMMARY  | 1           |
| I. BACKGROUND  | 2           |
| II. OBJECTIVES   | 3           |
| III. APPROACH  | 4           |
| A. Selection of Propagation Path                               | 5           |
| B. Equipment   | 7           |
| IV. RESULTS  | 9           |
| A. Boat Measurements   | 9           |
| B. San Clemente - Santa Catalina Measurements<br>July 1971     | 11          |
| C. San Clemente - Santa Catalina Measurements<br>November 1971 | 14          |
| V. CONCLUSIONS   | 17          |
| VI. RECOMMENDATIONS  | 18          |
| VII. REFERENCES  | 19          |
| VIII. FIGURES  | 20          |
| IX. TABLES   | 57          |
| X. APPENDIX (Meteorological Data)                              | 64          |
| XI. ACKNOWLEDGEMENTS   | 129         |



|                    |                                     |
|--------------------|-------------------------------------|
| Accession For      |                                     |
| NTIS GRA&I         | <input checked="" type="checkbox"/> |
| DTIC TAB           | <input type="checkbox"/>            |
| Unannounced        | <input type="checkbox"/>            |
| Justification      |                                     |
| By                 |                                     |
| Distribution/      |                                     |
| Availability Codes |                                     |
| Dist               | Avail and/or Special                |
| A-1                | 23                                  |

## SUMMARY

A series of carefully controlled radio propagation measurements were performed over a period of one year in the Southern California off-shore area. The purpose of the measurements was to determine antenna heights for optimum utilization of the radio propagation properties of the oceanic surface evaporation duct. Over water radio propagation links with vertically spaced antennas were operated in the frequency range from 1 - 10 GHz at 19 nautical miles over-the-horizon paths. It was found that for L- and S-band frequencies the highest antenna virtually all the time receives the highest signals (or, what is the same, gives the longest detection ranges). For X-band stronger signals are received 10 percent more often on the low sited antenna (15 feet above mean sea level) compared to the high antenna (65 feet above mean sea level). About five percent of the time the lower antenna receives signals which are 6 dB stronger than those received by the higher antenna. It seems unlikely that a cost effectiveness analysis based on those percentages would justify addition or relocation of ship board radar antennas.

## I. BACKGROUND

A persistent atmospheric phenomenon found over oceans is a low level duct just above the water surface. It is caused by evaporation and produces a refractive index profile decreasing with height. This duct has a significant influence on microwave radio propagation and its effect has to be taken into account for accurate radar coverage and microwave communications predictions. Under extreme conditions this duct can virtually trap all microwave energy and act as a waveguide. It is tempting to exploit such a capability, for example over-the-horizon detection of small surface targets. For maximum utilization of this capability one would like to know how existing antennas perform under various ducting conditions and if there is an optimum antenna height for use on board ship. Relocation or addition of antennas on board ship is, of course, a question of far reaching consequences both from an engineering and an economical viewpoint. Those implications put a special demand on a program that investigates microwave propagation in the oceanic surface evaporation duct. Quick conclusions drawn from spotty measurements could have disastrous consequences. Only comprehensive and thorough measurements combined with sound theoretical interpretations can provide the data needed as an input for cost-effectiveness studies which determine optimum utilization of the surface evaporation ducting phenomenon.

## II. OBJECTIVE

Conduct a series of well controlled measurements in an ocean environment which provide a basis for a statistical judgment of the relative performance of high and low sited antennas. This necessitates measurements over extended periods of time in different seasons and geographical areas. The present report covers the findings in the Southern California off-shore area.

### III. APPROACH

In order to represent most closely open sea conditions, one would prefer to conduct measurements from aboard ship. Ideally, one would like to use one radar for each frequency under investigation, switchable to antennas at different heights and track calibrated targets continuously. This would require a dedicated ship, special radars calibrated and modified to permit continuous recording of the radar returns from calibrated targets. The cost of such measurements would be tremendous and funding for such an exercise would be difficult to obtain. A compromise approach seems to be in order which gives data of sufficient quality to draw sound conclusions at reasonable cost. The most important consideration, of course, is the quality of the data. Tracking targets of opportunity with unknown and highly aspect-dependent cross-sections could produce misleading data. Using unmodified radars located at different ship-board heights (maybe even operating at different frequencies) will not provide reliable data. With these considerations in mind, it was decided not to involve ships for the basic measurements. The substitute most closely resembling open sea conditions is a propagation path between two islands. A low sited transmitter on one island radiates several frequencies simultaneously and continuously. Vertically spaced antennas on another island receive the signals. For each frequency only one receiver is used which sequentially is switched to the different receiving antennas. This eliminates the

need for careful calibration of the critical active components in the system. The significant features of the concept of using a propagation path between two islands are:

1. Open sea conditions are closely simulated by islands sufficiently removed from land influence.
2. Variation of target cross-section is eliminated by using a one way propagation path.
3. Precise antenna adjustments are possible as both terminals are on a fixed platform.
4. Continuous and long term measurements are easily achieved with minimum involvement of personnel and equipment.
5. Only passive components are switched at the receiver site minimizing calibration uncertainties.
6. Compared to measurements involving ships the island measurements are inexpensive and oppose little logistic problems.

A. Selection of Propagation Path

Results from extensive previous measurement programs show the possible influence of elevated refractive structures on propagation data. In particular, for long propagation paths this influence becomes more pronounced. Figure 1 illustrates this effect for a variable 9.6 GHz propagation path. In this case, the transmitter was mounted on a small boat at a height of 15 feet while the receiver remained at a fixed height of 120 feet. In figure 1a, path loss is plotted as a function of distance for the boat moving away from the receiver to a maximum distance of 54 miles and then returning. Up

to distances of approximately 40 miles, path loss as a function of range behaves as expected (diffraction being responsible for the slope in the curves out to some 26 miles and tropospheric scatter for the slope from 26 - 40 miles). Beyond 40 miles path loss unexpectedly decreases. The explanation of this decrease in path loss or increase in received field strength can be found from the refractive index profile measured with a sounding balloon as shown in figure 1b. A refractive layer is responsible for bending rays back to the ground as illustrated by the ray trace picture of figure 1c at about the distance where the measured path loss decreased. Elevated layer structures may refract radio rays downward and thus create a "skip zone" in which there is no effect from the layer. The length of this skip zone increases with the height of the refractive layer. This is the reason that the influence of these layer structures increases with the length of the propagation path. For our present investigation in which we are concerned with the effect of the oceanic surface evaporation duct we want to avoid excessive contamination of our results by atmospheric refractive structures other than the oceanic duct. Therefore, we want a propagation path that is not too long. On the other hand, we are only interested in over-the-horizon propagation paths which requires a minimum distance. For the terminal heights under consideration (15 feet for the transmitter, 65 feet for the highest receiving antenna) the shortest path length to be just beyond the horizon is 15 nautical miles. Two

suitable islands in the Southern California off-shore area are San Clemente and Santa Catalina islands. Figure 2 shows their relative location and the location of the terminals. The path length of 19.3 nautical miles fulfills the previously discussed constraints. Both islands are removed sufficiently from the mainland that the propagation path selected can be considered to be representative of open sea conditions.

#### B. Equipment

A block diagram of the transmitting system is shown in figure 3. One oven controlled crystal oscillator phase locks three solid state microwave oscillators at L-, S-, and X-band frequencies respectively. These signals are combined in a triplexer and radiated by a 3 foot parabolic reflector having a log periodic feed. The performance characteristics for the transmitter are listed in table 1.

| <u>Band</u> | <u>Frequency<br/>GHz</u> | <u>Radiated Power<br/>dBm</u> | <u>Antenna Gain<br/>in dB</u> | <u>Antenna Beamwidth<br/>degrees</u> |
|-------------|--------------------------|-------------------------------|-------------------------------|--------------------------------------|
| L           | 1.0426                   | 25                            | 12                            | 20                                   |
| S           | 3.0075                   | 17                            | 26                            | 8                                    |
| X           | 9.624                    | 12                            | 32                            | 3                                    |

Table 1. Performance characteristics of transmitter

The mode of transmission is continuous wave and unmodulated for all three frequencies. The power requirements are 28 V, 0.25 A for the crystal oscillator and 20 V, 0.7 A for the microwave sources. The power requirements are low enough to be supplied by regular automobile

batteries for two week measurement periods. Figure 4 shows the complete transmitter at its location on Santa Catalina Island. The antenna height is 17 feet (5.6 m) above mean sea level.

A block diagram of the receiving system is shown in figure 5. Vertically spaced receiving antennas are sequentially switched to the triplexer which separates the three frequencies and feeds them into their respective receivers. The receiver intermediate frequency bandwidth is 2 kHz and the receiver automatic gain control voltage is recorded on strip chart recorders. The recording interval for one antenna is five minutes after which the timer switches to the next antenna. Special attention is given to frequent calibrations. Separately generated and carefully calibrated signals are applied to the triplexer. Figure 6 shows the antenna arrangement for the November 1971 measurements. The antenna heights are 16, 32, and 64 feet above msl. For the July measurements only two antennas were used at 9 feet and 63 feet above msl.

For X-band, the antenna beamwidth is only three degrees. This necessitates a very careful antenna alignment. An electrical alignment is not considered sufficient because of high signal fluctuation. The alignment of both transmitting and receiving antennas was done with theodolites using survey points. The accuracy of this alignment is considered better than one-half of one degree.

#### IV. RESULTS

##### A. Boat Measurements

Previous measurements for variable path lengths used a small boat carrying the transmitter and a shore-based elevator-tower assembly for the receiver as described in reference 1. These measurements were performed over a period of six months. Data obtained at distances of 19 nautical miles are shown in figures 7-9. In these figures, path loss is plotted versus 18 separate trips for three different antenna heights at 15, 75, and 122 feet. Path loss values of consecutive trip numbers for each of the antenna heights are connected for illustration purposes only. The horizontal dashed lines are the calculated diffraction losses for the three antenna heights (lowest line belonging to the low antenna etc.). Figure 7 shows the L-band data (data of trip number 2-6 are missing due to equipment failure). In all cases, the signals received with the higher antenna are stronger than those with the next lower antenna. The much higher signals on trip number 8 are due to a Santa Ana condition in which dry desert air moves over the water and often leads to dramatic ducting conditions. Such occasional drastic ducting conditions are not unique to the Southern California coastal area. They can be found at other oceanic areas close to or surrounded by desert land masses (e.g. the Mediterranean). The strong ducting encountered on trip number 8 caused higher signals to be

received on the middle antenna than on the high antenna for S-band, as shown in figure 8, and a complete reversal, that is, the highest signal on the low antenna and the lowest on the high antenna for X-band in figure 9. For S-band, on all other trips signals increased (or path loss decreased) with antenna height. The measured values for S-band frequently are lower than the calculated values due to diffraction. In comparing the theoretically calculated lower limits with the much smaller measured data one has to remember that for the calculation of the diffraction loss a so-called standard atmosphere is assumed. Subrefractive conditions will cause an increase in the loss. Some of the values in figure 8 appear to be too low to be explained by this interpretation. However, even if there is some doubt in the absolute path loss values for S-band, this is of no consequence for the major present concern. The evaluation of the relative performance of vertically spaced antennas is independent of the magnitude of the received fields.

Figure 9 shows the measurements for X-band. For two trips (number 8 and 12) signals decrease with antenna height. In those cases one would have longer detection ranges using a low sited antenna.

Obviously, the number of data points presented in figures 7-9 does not permit one to draw statistically sound conclusions. However, the findings from figures 7-9 are consistent with those from the island measurements. The island measurements avoided two

shortcomings of the boat measurements; they provided a large sample of continuous data and eliminated possible contamination from land influence by placing both terminals of the propagation link away from the mainland.

B. San Clemente - Santa Catalina Measurements July 1971

In July 1971, a ten day measurement was conducted using a transmitter height of 17 feet on Santa Catalina Island and receiving antennas at 9 and 63 feet on San Clemente Island. The data are presented in a format considered to be most useful as a basis for evaluating optimum antenna heights. Figure 10 shows the logarithm of the ratio of the signals (or equivalently the path loss difference) received with the high and the low sited antenna respectively. The ordinate value is zero for equal signals on both antennas. Positive ordinate values indicate higher signals on the higher antenna and negative ordinate values higher signals on the lower antenna. The abscissa shows two rows of numbers. The first row indicates the time of day ("12" is noon and "0" midnight) and the second row the date in July. Figure 10 indicates consistently higher signals on the higher antenna except for a few brief periods in the first three days of the measurement period. The kind of presentation in figure 10 has an added advantage that one does not even need to know the transmitter power. It cancels when the ratios are formed. However, the absolute power levels are of considerable interest for other considerations and are shown in the form of path loss in figure 11. The dashed lines indicate calculated path loss values for

free space propagation and diffraction. Both are not limiting values and are occasionally exceeded by the measured signals. Figures 12 and 13 show the amount of fading measured for L-band. The lower antenna did encounter both higher average and absolute fading values. The information of figures 10-14 is presented in tabular form in table 2.\* This format should be most helpful to a systems designer who is faced with the task of making cost-effective antenna siting decisions. The first block of numbers in table 2 gives the percentage of time signals received on the higher antenna exceed the signals received by the lower antenna by a certain value in dB. This information is absolutely necessary if one considers costly relocation or addition of other antennas. Only the gain of a significant amount of signal for a large percentage of time could justify addition of other antennas. For instance, if one considers a gain of 6 dB of the lower antenna over the higher a significant amount, then table 2 tells us that in 99.6% of the measured period the higher antenna exceeded the lower antenna by 6 dB. Or turning it around, in 0.4% of the time were the signals received by the lower antenna 6 dB higher than those by the upper antenna. Both absolute and average fading values are higher for the lower antenna. In only 1.9% of all cases did the average fading of the higher antenna exceed 6 dB, compared to 24% for the lower antenna. Similar values are found for the absolute fading.

Figures 14-17 show the results of the July 1971 measurement period for S-band. Figure 14 represents, again, the signal ratio

---

\*Tables 2 through 7 - pages 58 to 63.

of high versus low antenna. Higher signals are received consistently by the higher antenna. Path loss, average and absolute fading are shown in figures 16 and 17. A large percentage of the time, fading was below the one dB threshold value used in the data reduction. During those time periods the values of path loss are quite steady indicating little change in atmospheric conditions. The absence of strong atmospheric changes makes a periodic structure visible which is clearly diurnal in character. It correlates with the diurnal changes in moisture measured on San Clemente Island. Table 3 summarizes the S-band data in the same format described before. No reversal of received signal strength for high and low antenna occurred during the measurement period. Fading for the lower antenna was stronger than for the high antenna.

The X-band data are shown in figures 18-21. The high-low antenna difference (signal ratio) in dB of figure 18 indicates consistently higher signals for the higher antenna. Path loss and fading are shown in figures 19-21. The X-band data are summarized in table 4. The first block shows again the percentage of time the signal ratio of high and low antenna exceed a certain value in dB. Fading at the lower is again stronger than on the higher antenna.

During the July measurement period, separate meteorological measurements were performed in the marine boundary layer from an off-shore oceanographic platform described in reference 1. Even though the meteorological measurements were not in the immediate

vicinity of the radio propagation path, they proved to be quite useful in checking the internal consistency of the data. Figure 22 shows an M-profile measured on July 19, 1971 indicating a duct height of some 6 m (similar duct heights were measured throughout the radio measurement period). In figure 23 calculated values of signal ratios as a function of duct height are shown for the geometry and configuration for the San Clemente - Santa Catalina propagation link. For a duct height of 6 m we would expect signal ratios of 14, 16, and 8 dB for L-, S-, and X-band frequencies. Comparing these values with figures 10, 14, and 18 one finds an excellent agreement between calculated and measured effects of the oceanic evaporation duct on microwave radio propagation.

#### C. San Clemente - Santa Catalina Measurements November 1971

For the November measurement period some modifications were incorporated for measurements and data presentations. The most important modification was the addition of a third antenna between the high and the low antenna. This was done to satisfy conjectures there might be a magic antenna height around 30 feet for which signals were stronger than either for the high or for the low antenna. The addition of the third antenna changes the data presentation. The signal ratios are formed now for high-low, mid-low, and high-mid antenna positions. The presentation of average fading was abandoned because the absolute fading appears to be the critical information for system design considerations concerned with fading margins.

Figure 24 shows the path loss for the high antenna and the signal ratio of high and low antenna measured from 4 - 17 November 1971. The high signal levels on 4 and 16 November are due to elevated layers subsiding close to the water. The influence of those elevated layers is similar in figures 25 and 26 which show path loss for mid and low antenna and the signal ratios for the other antenna configurations. The fading for the three antennas is shown in figure 27. Table 5 summarizes in tabular form the findings from the November measurement for L-band. The first block gives, again, the percentage of time the signal ratio of high to low antenna exceeds a given value. For instance, in 99.7% of the two week measurement period the signals received with the higher antenna exceeded those from the lower by 3 dB. Or, in 0.3% of the time signals on the low antenna were twice as high as on the high antenna. Blocks two and three compare the middle with the low antenna and the high with the middle antenna. The remaining three blocks in table 5 give the percentage of time each of the antennas exceeds certain absolute fading values. Fading appears to increase with decreasing antenna height.

The S-band data are plotted in figures 28-31. Figure 28 shows path loss for the high antenna and the signal ratio of high and low antenna. The peaks and dips in the curves on 4 and 16 November are, again, caused by very low elevated layers. The influence of elevated layers is often accompanied by strong fading. According to figure 31, fades of 25 dB were observed on 4 November.

Table 6 summarizes the S-band data in the format explained before. Again, fading decreases with increasing antenna height.

Figures 32-35 show the X-band data. The influence of the elevated layers results in an enhanced signal strength on 4 November and a weakened signal on 16 November 1971. Signal reversals (i.e. higher signals on the lower antennas) do occur. From table 7 one can find that in 89.1% of the time the high antenna received stronger signals. The low antenna outperformed by more than 6 dB the high antenna in 4.8% of the time and the middle antenna in 2.2% of the time. The fading does not show previously observed trend of decreasing values with increasing antenna height.

## V. CONCLUSIONS

Extensive measurements at L-, S-, and X-band frequencies at 19 nautical miles over-the-horizon oceanic radio propagation paths in the Southern California off-shore area indicate a significant enhancement of the signals a large percentage of the time. This enhancement must be taken into account for accurate propagation range predictions. The influence of the evaporation duct is most pronounced at X-band and decreases with decreasing frequency. Stronger signals are observed on a low sited antenna ( $\approx 15$  feet above MSL) compared to a high antenna ( $\approx 65$  feet above MSL) for X-band approximately 10% of the time. About five percent of the time the lower antenna receives signals which are 6 dB stronger than those received by the higher antenna. These values are considered representative for the Southern California off-shore area and are in agreement with predictions of probability of ducting based on available meteorological data.

## VI. RECOMMENDATIONS

All measurements in this report were confined to one geographical area. The same measurements should be conducted in one or two other areas of the world and the findings compared with predictions from available meteorological data. If agreement is found between measurements and predictions, then it will not be necessary to conduct measurements in each individual location of interest. The radio measurements so far have shown an increased influence of the oceanic duct with increasing frequency. Frequencies above X-band should be added to the measurement program in order to establish the influence of surface roughness, duct inhomogeneities and absorption on propagation of higher frequencies in the oceanic surface evaporation duct.

## VII. REFERENCES

1. Hitney, H. V. and J. F. Theisen, "A Study of Microwave Radio Propagation in the Evaporation Duct," (U), NELC TN 1757, 30 October 1970 (C).

## VIII. FIGURES

1. (a) Path loss as a function of distance for a 9.6 GHz signal and antenna heights of 15 and 120 feet.  
Path loss increases at ranges over 40 miles because of reflection from elevated layers.  
(b) Refractive index profile at time of path loss measurements.  
M is modified refractive index.  
(c) Ray trace for the refractive index profile of (b) and transmitter height of (a). Rays bend downward again at longer ranges explaining the increased signals (or decreased path loss) of (a).
2. Propagation Path
3. Transmitting System
4. Transmitter
5. Receiving System
6. Receiving Antennas
7. Path loss for a 19 nautical mile propagation path at L-band
8. Path loss for a 19 nautical mile propagation path at S-band
9. Path loss for a 19 nautical mile propagation path at X-band
10. Difference high-low antenna L-band July 1971
11. Path loss L-band July 1971
12. Average fading L-band July 1971
13. Absolute fading L-band July 1971
14. Difference high-low antenna S-band July 1971
15. Path loss S-band July 1971

16. Average fading S-band July 1971
17. Absolute fading S-band July 1971
18. Difference high-low antenna X-band July 1971
19. Path loss X-band July 1971
20. Average fading X-band July 1971
21. Absolute fading X-band July 1971
22. M-profile for 19 July 1971
23. Calculated signal ratios as a function of duct height
24. Difference high-low antenna and path loss L-band November 1971
25. Difference mid-low antenna and path loss L-band November 1971
26. Difference high-mid antenna and path loss L-band November 1971
27. Fading L-band November 1971
28. Difference high-low antenna and path loss S-band November 1971
29. Difference mid-low antenna and path loss S-band November 1971
30. Difference high-mid antenna and path loss S-band November 1971
31. Fading S-band November 1971
32. Difference high-low antenna and path loss X-band November 1971
33. Difference mid-low antenna and path loss X-band November 1971
34. Difference high-mid antenna and path loss X-band November 1971
35. Fading X-band November 1971

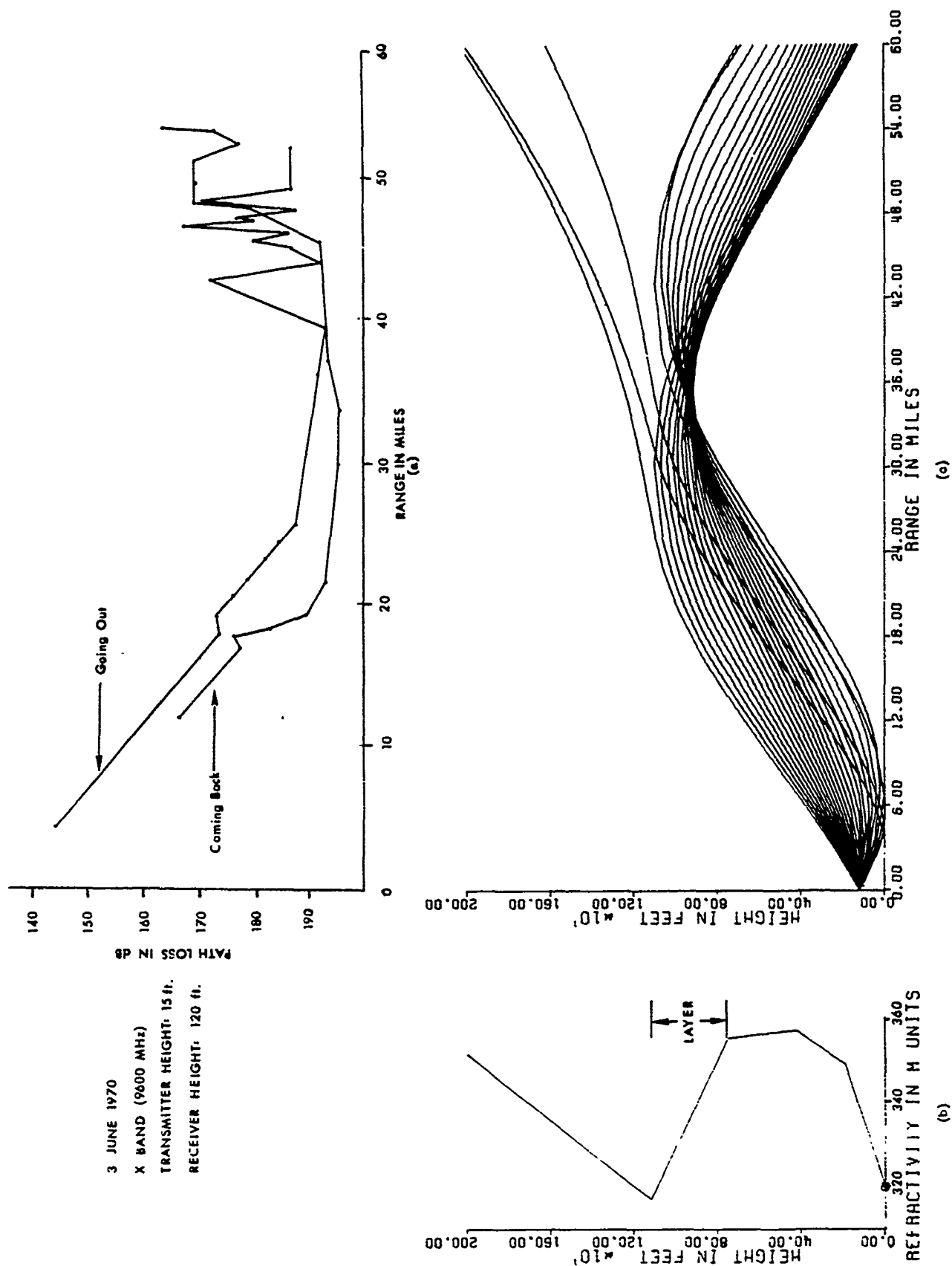


Figure 1 Influence of elevated refractive structures on a

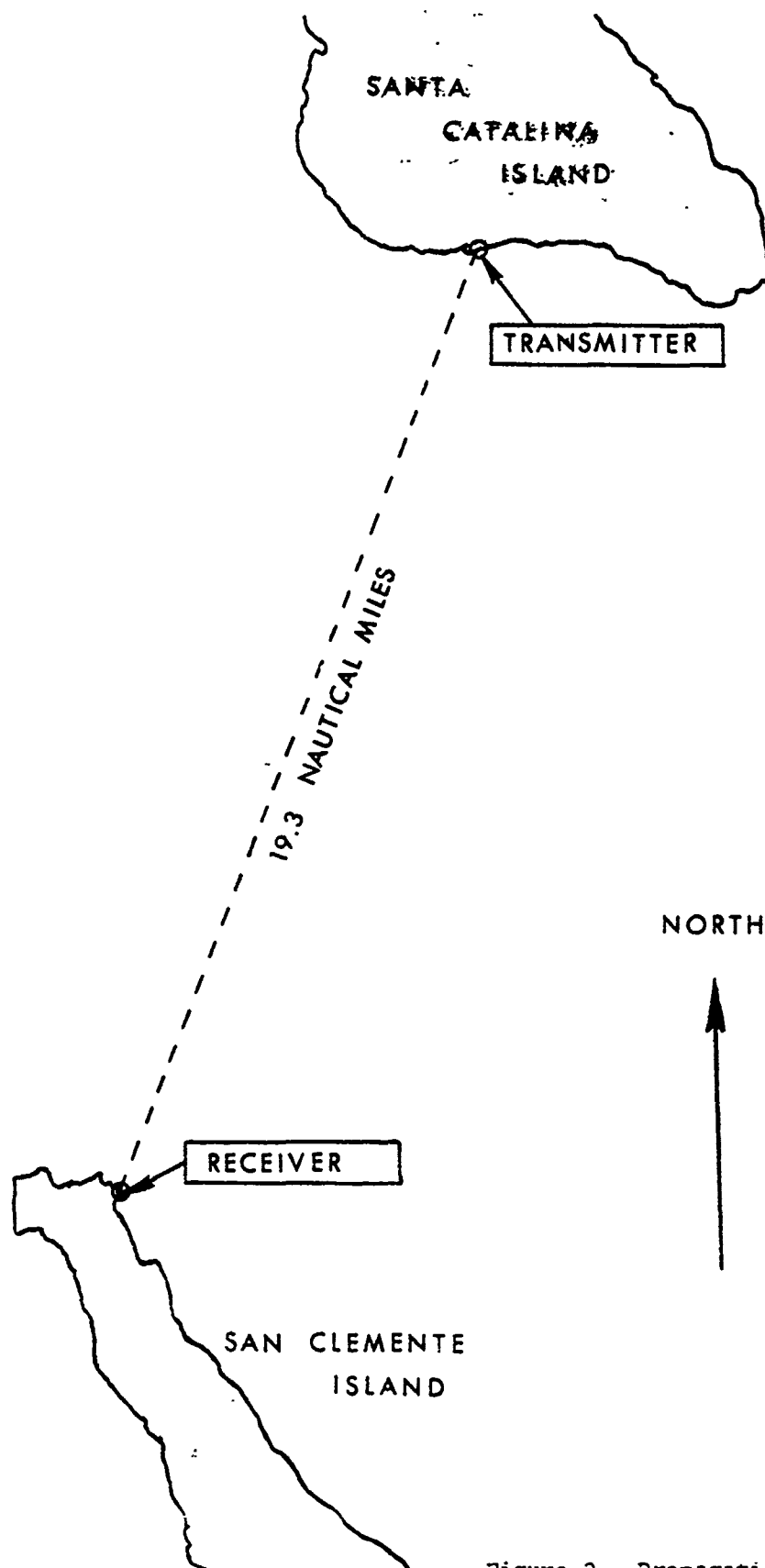


Figure 2. Propagation Path

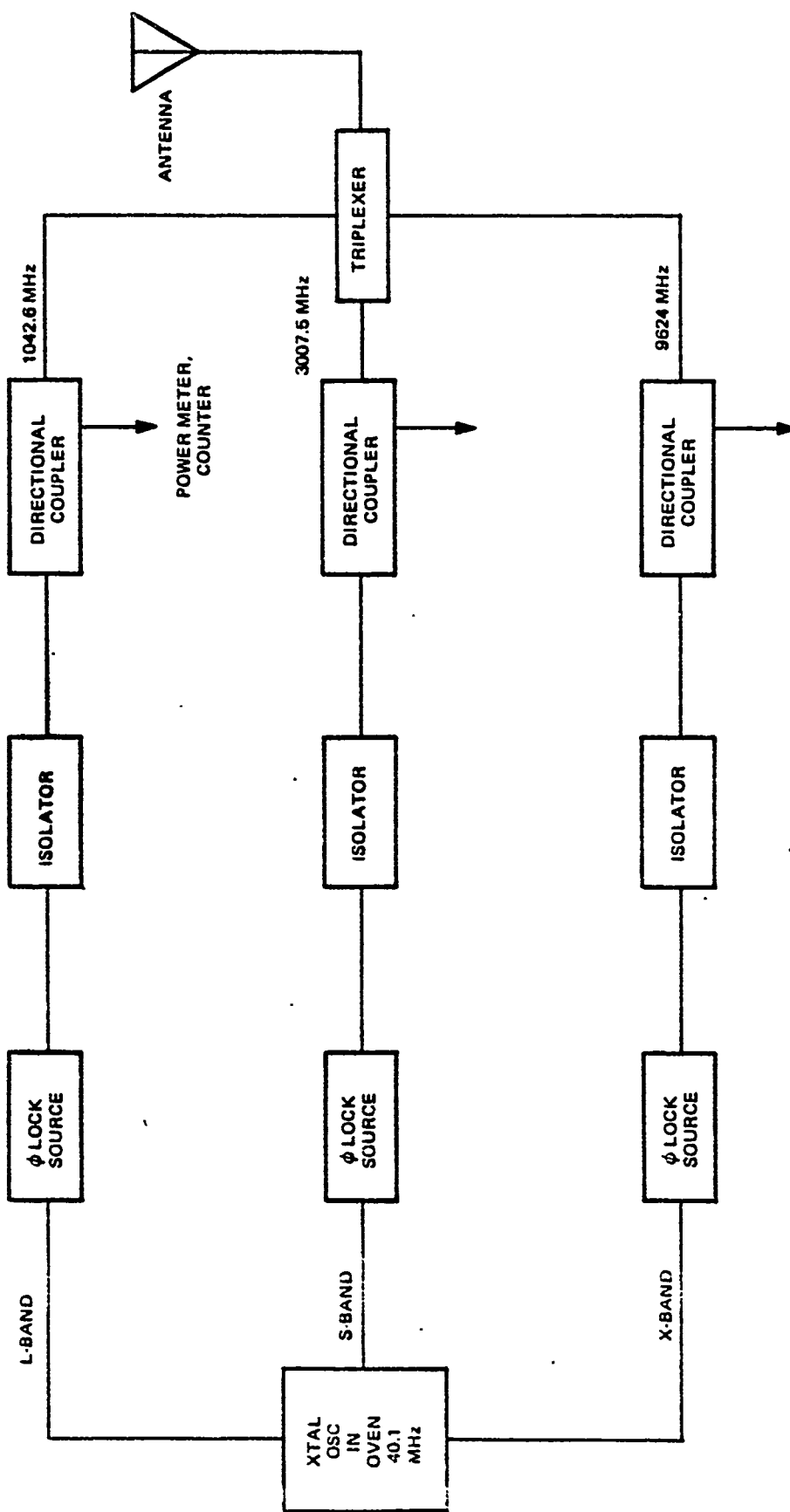


Figure 3. TRANSMITTING SYSTEM



Figure 4. Transmitter

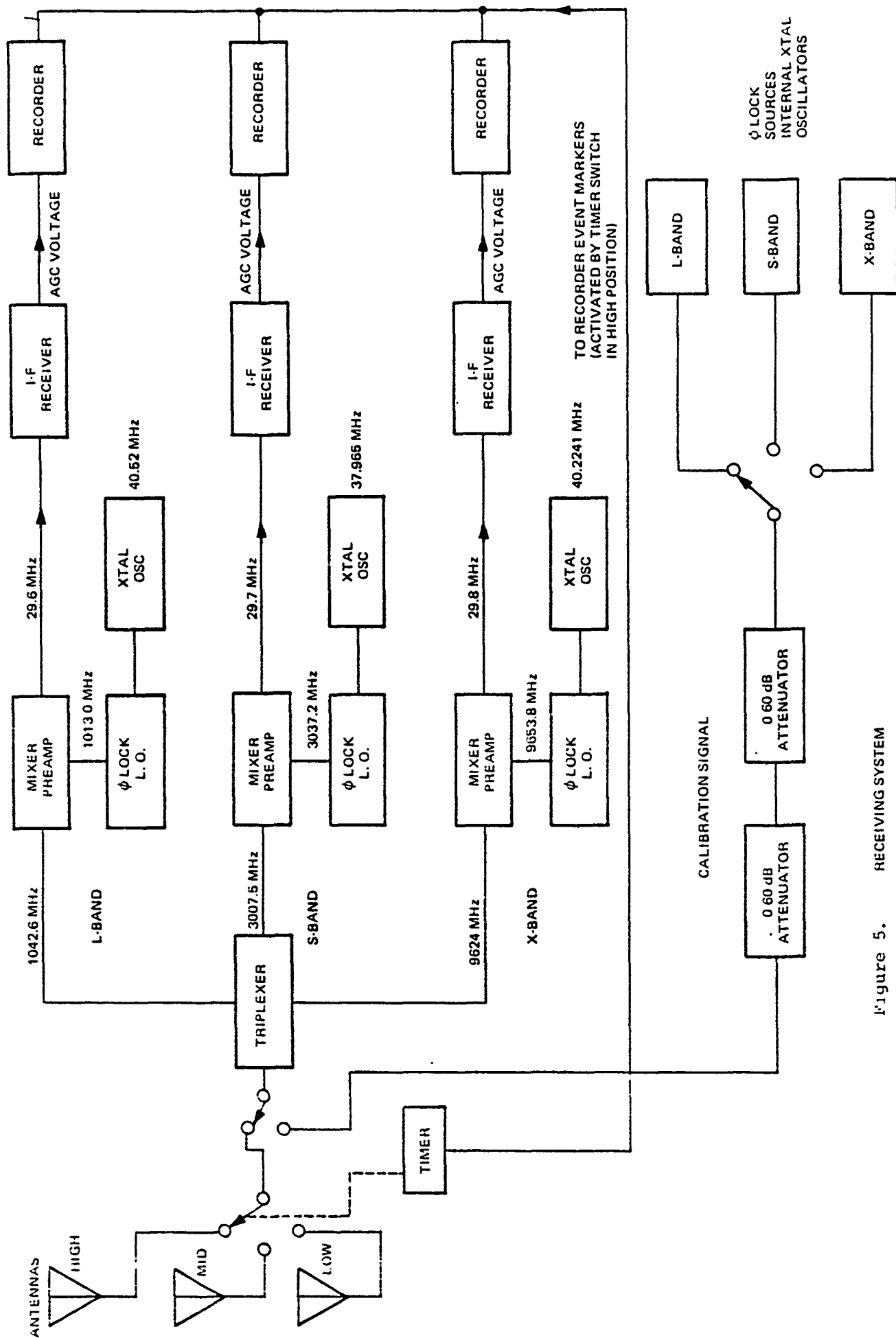


Figure 5. RECEIVING SYSTEM



Figure 6. Receiving Antennas

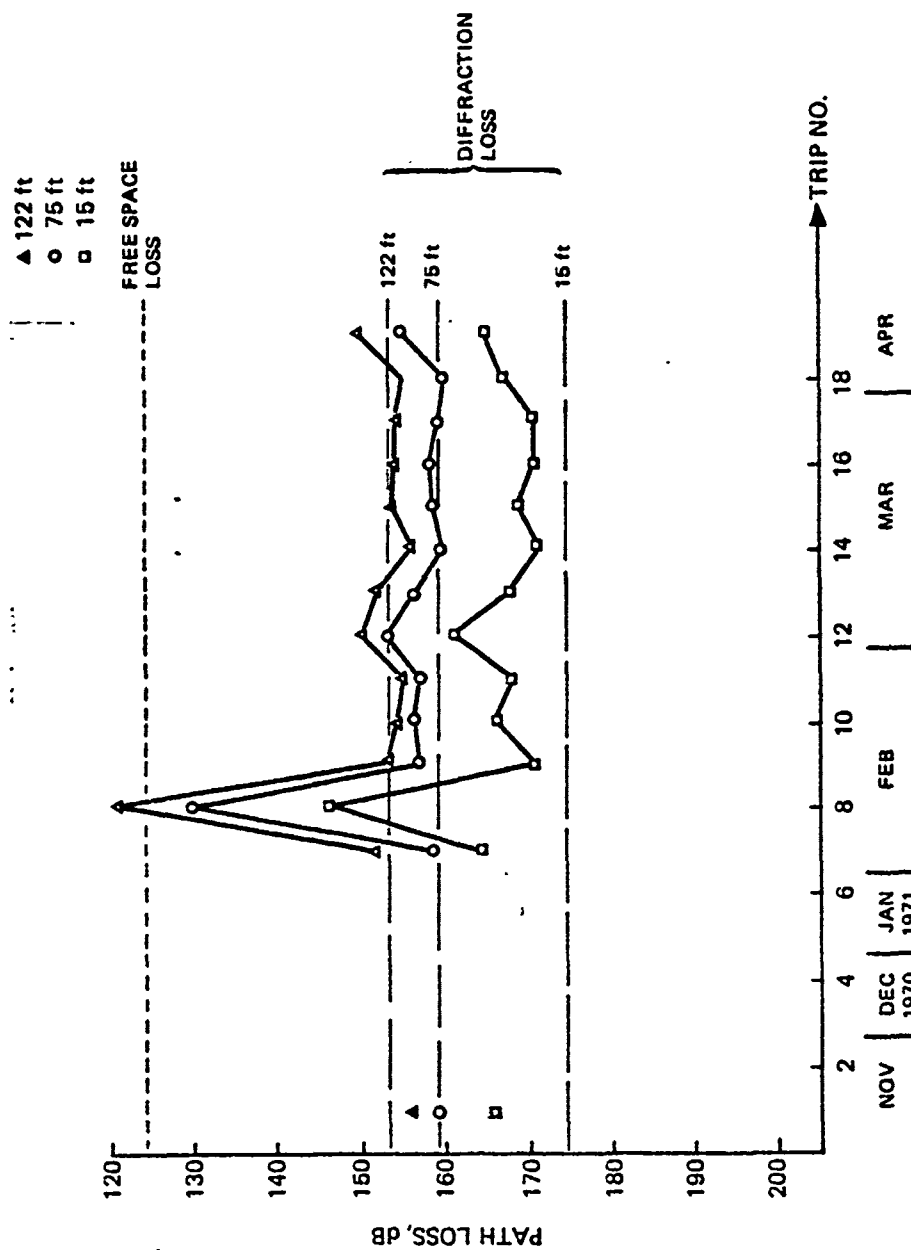


Figure 7. Path Loss at 19 nautical miles

L BAND

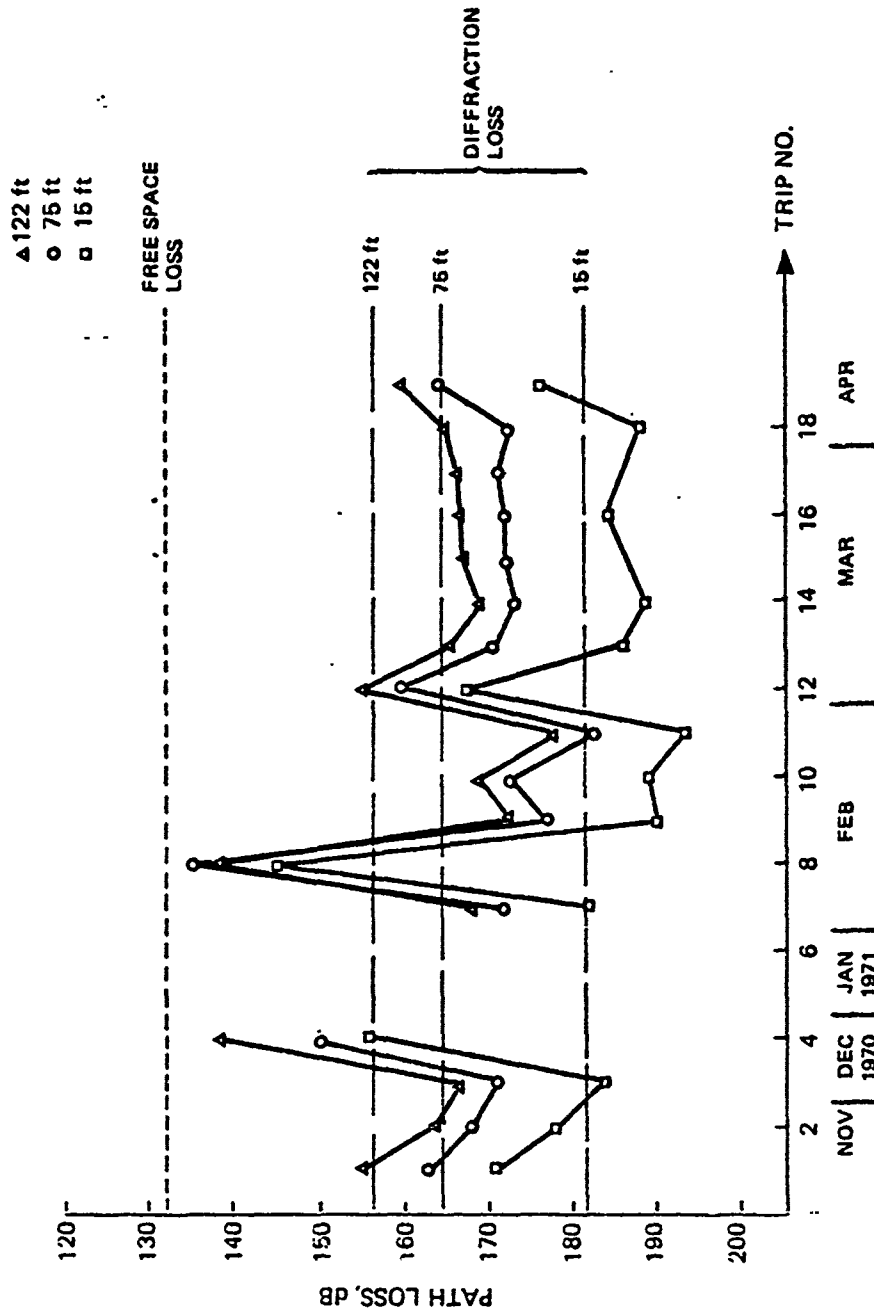


Figure 8. Path Loss at 19 nautical miles

S BAND

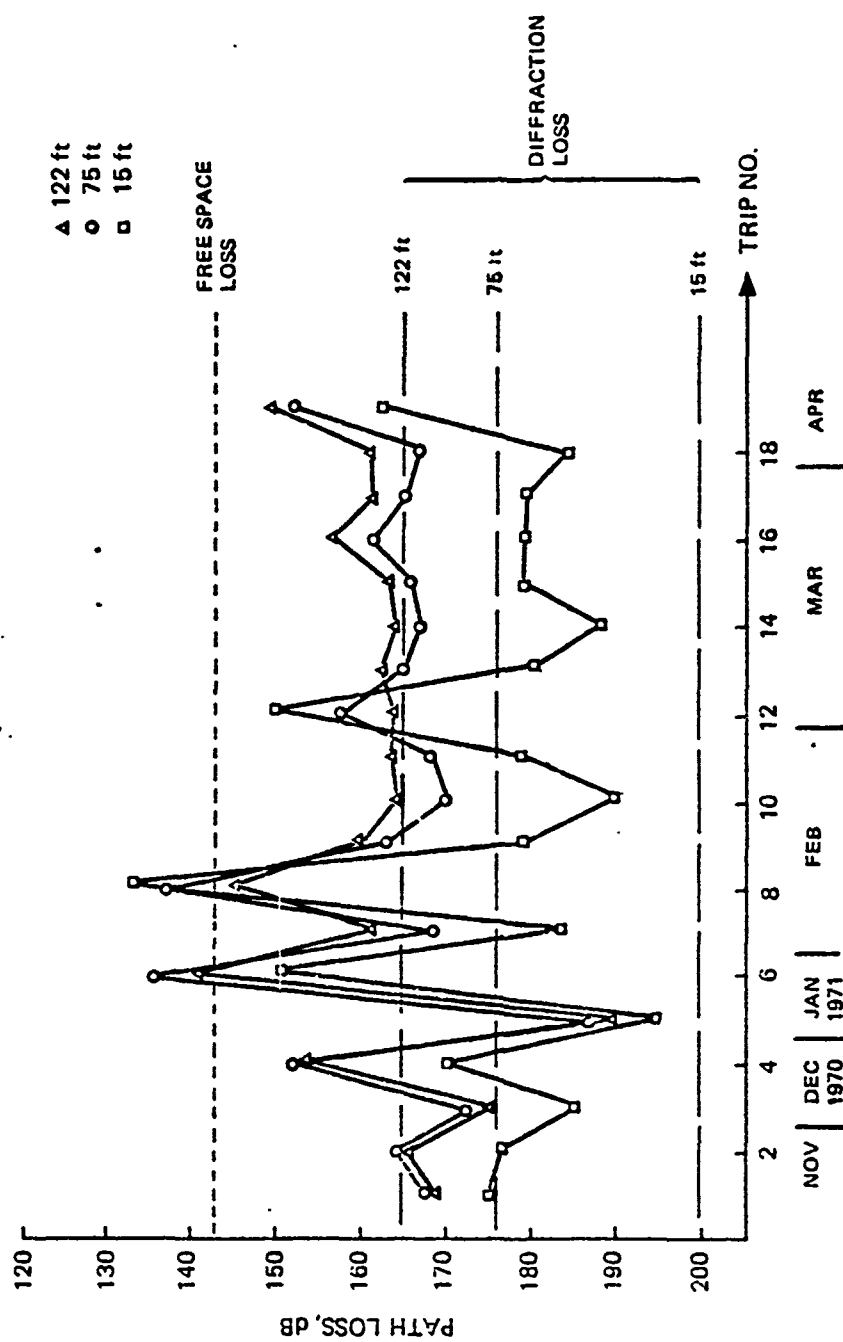


Figure 9. Path Loss at 19 nautical miles

X BAND

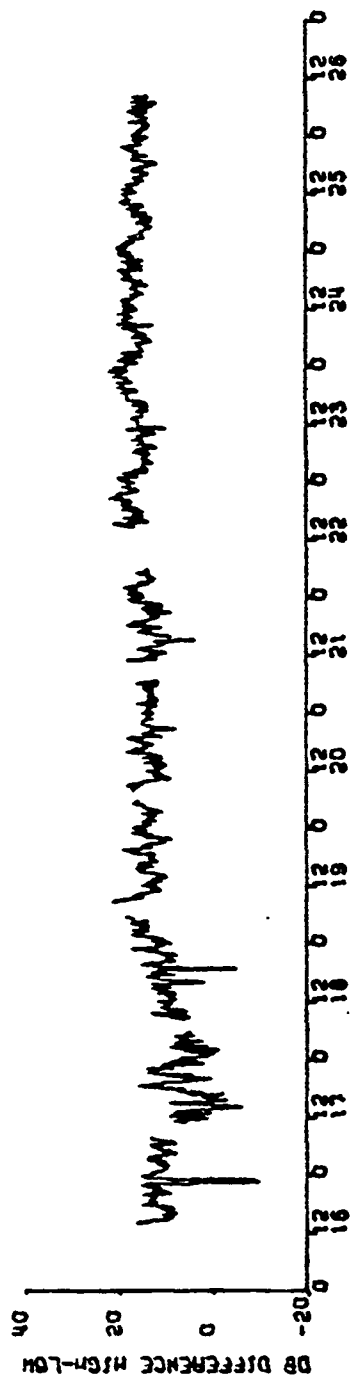


Figure 10. L HAD CATALINA TO SAN CLEMENTE ISLAND JULY 1971

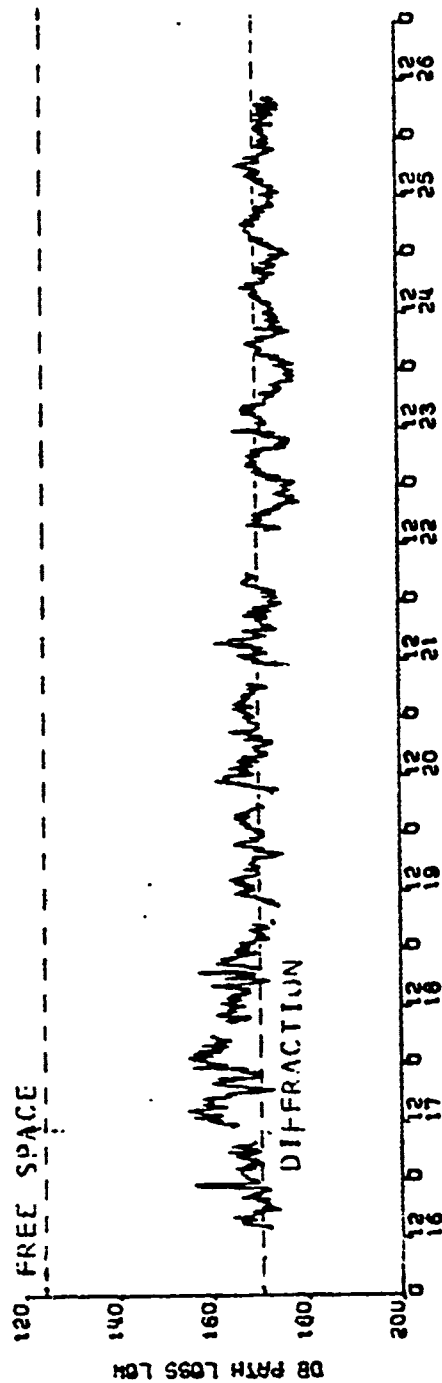
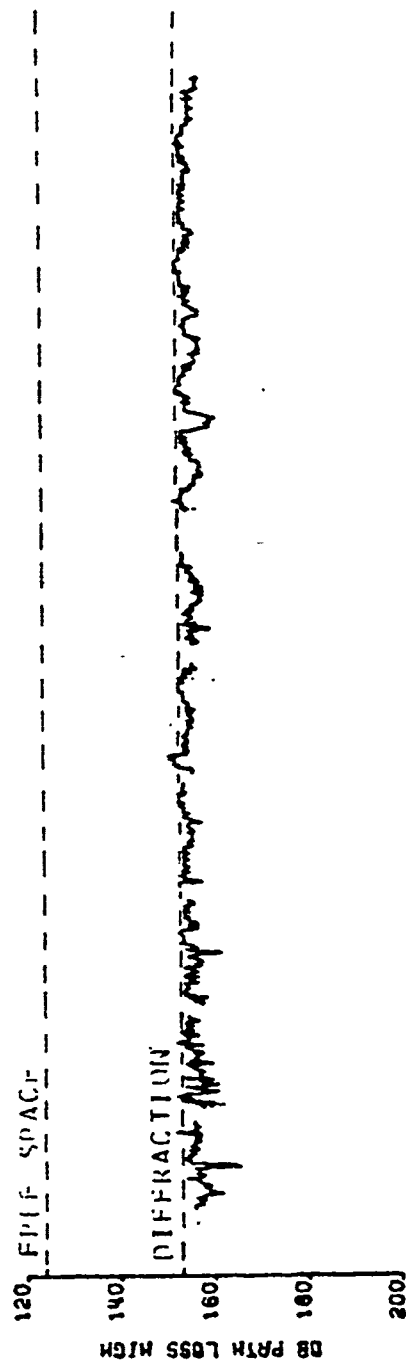


Figure 11. L BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971



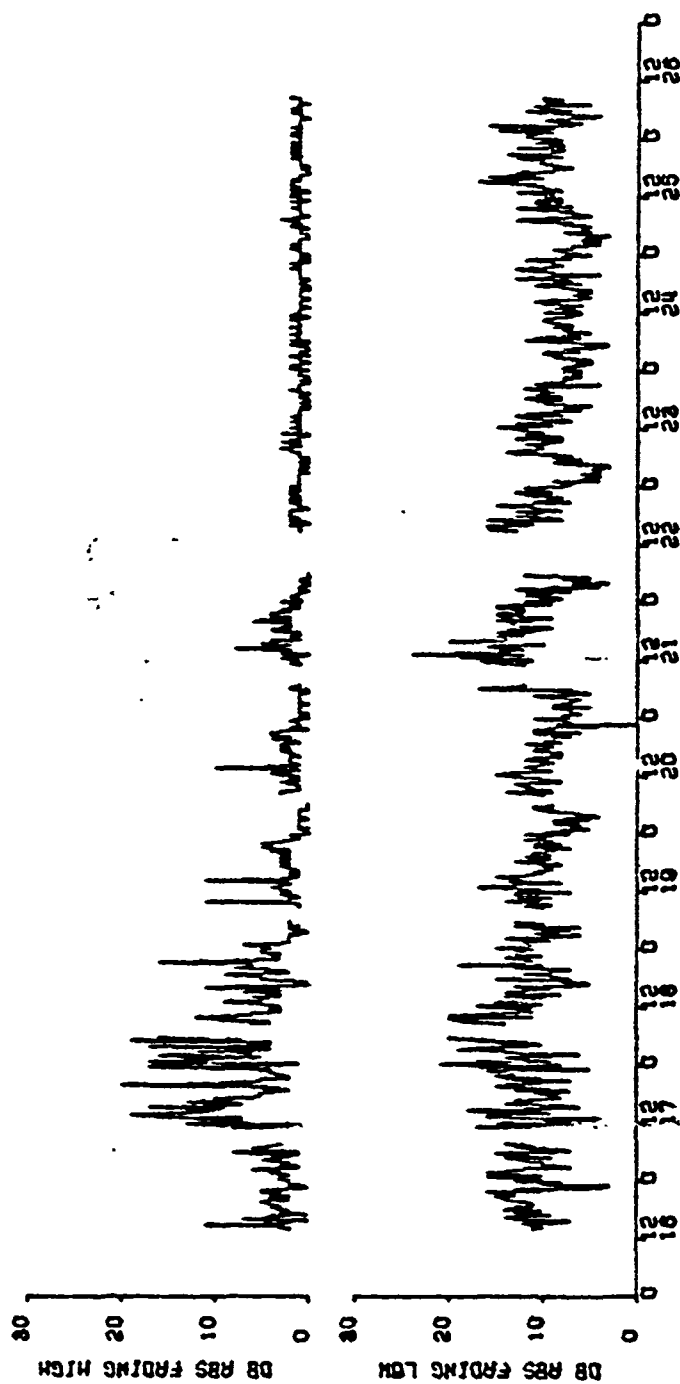


Figure 13. L BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

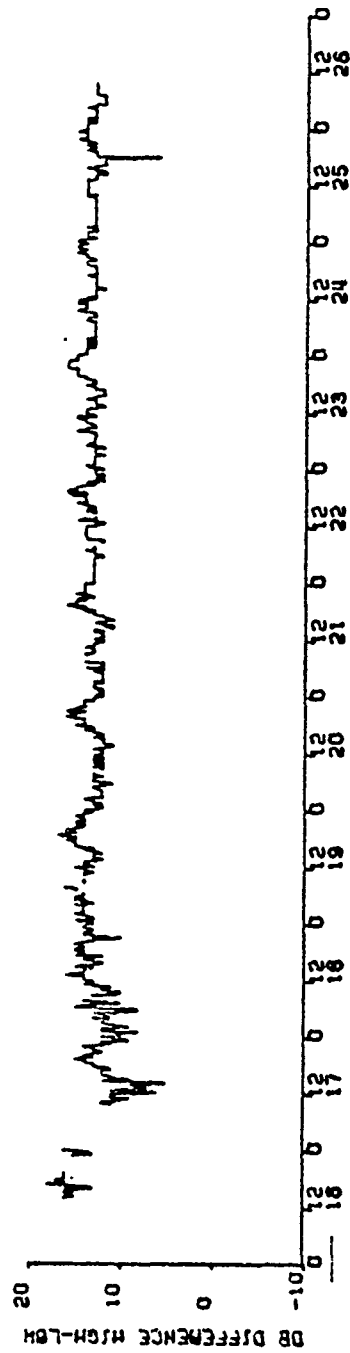


Figure 14. S BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

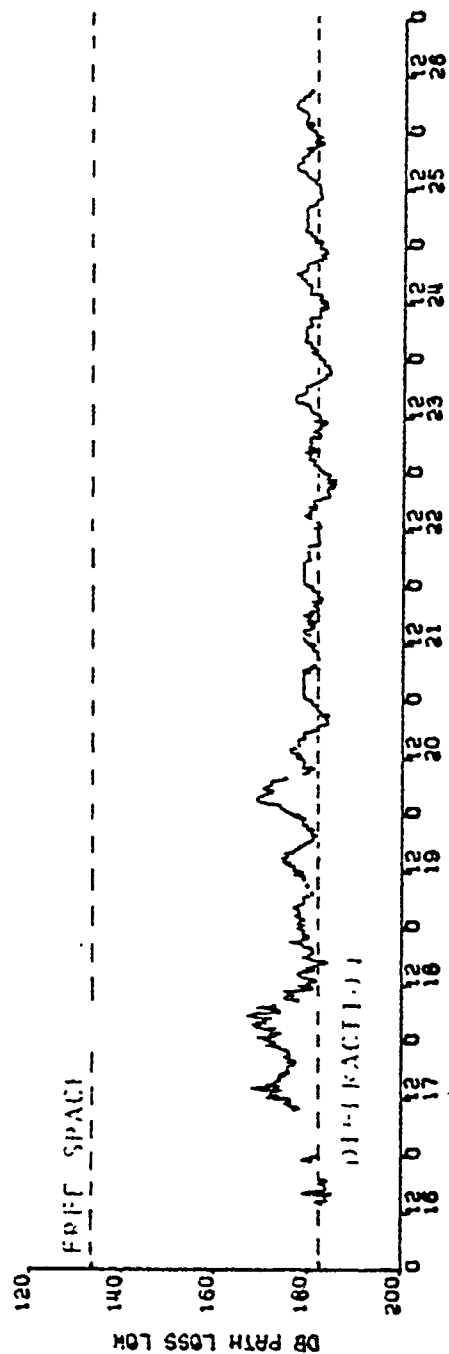
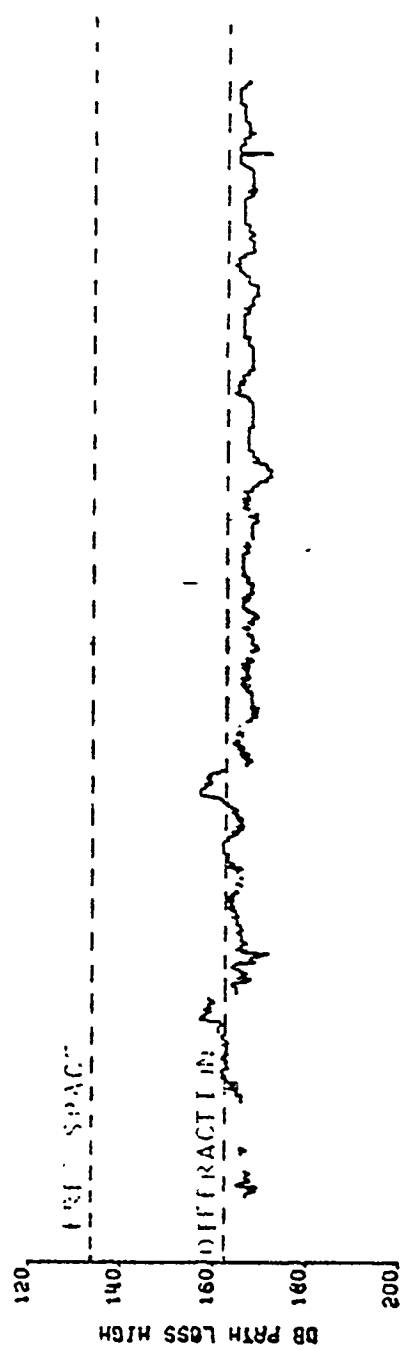


Figure 15. S BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

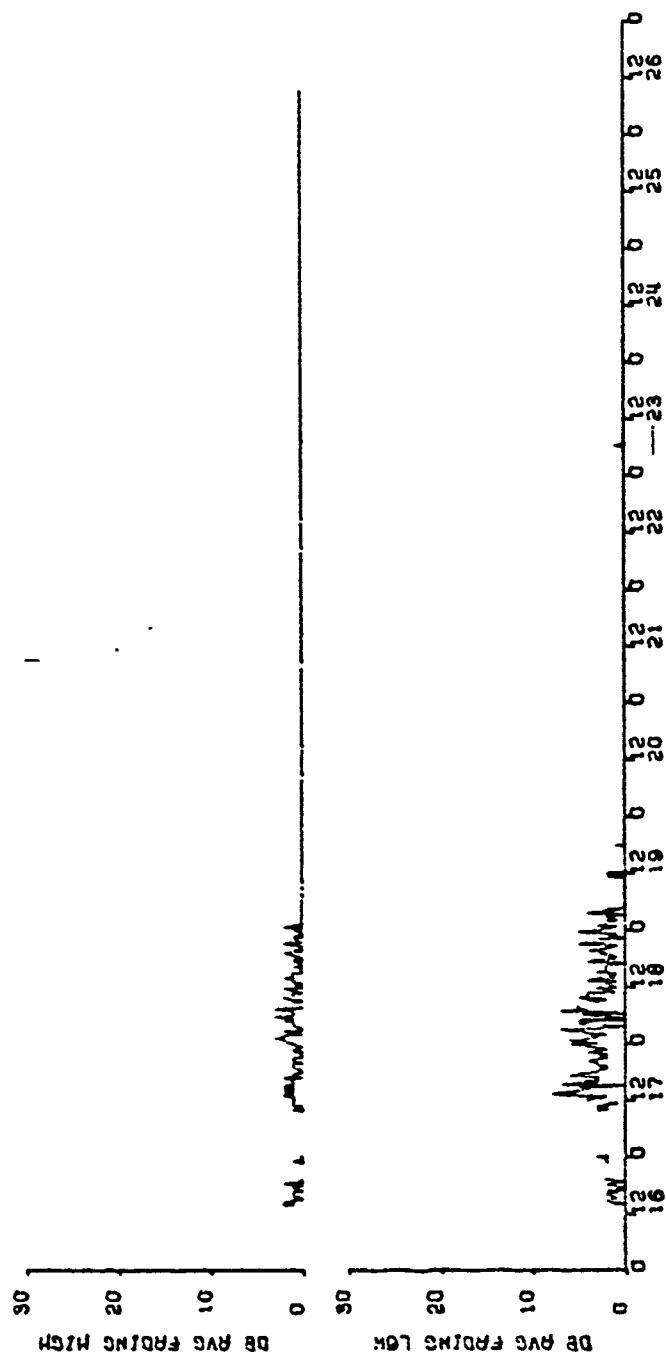


Figure 16. S BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

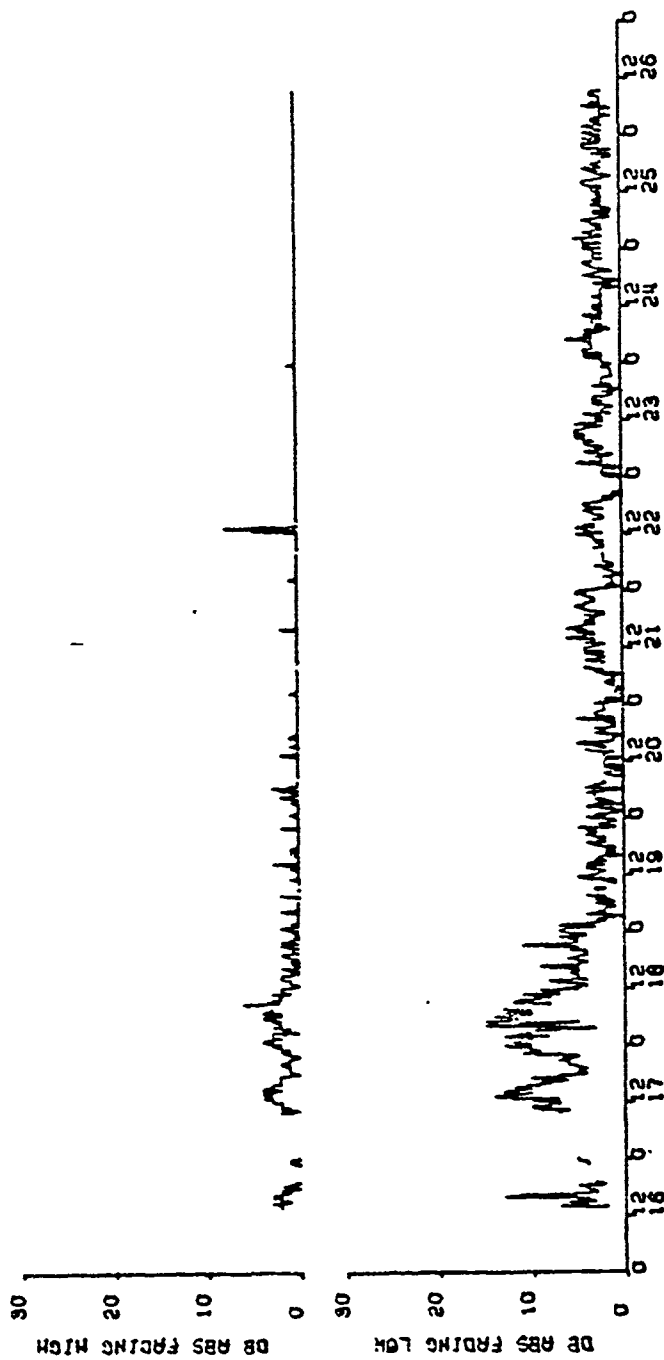


Figure 17. S BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

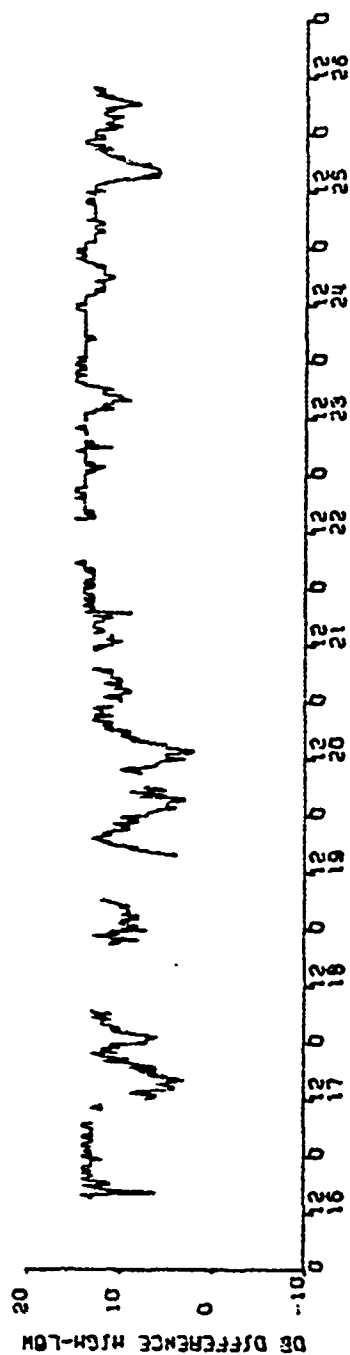


Figure 18. X BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

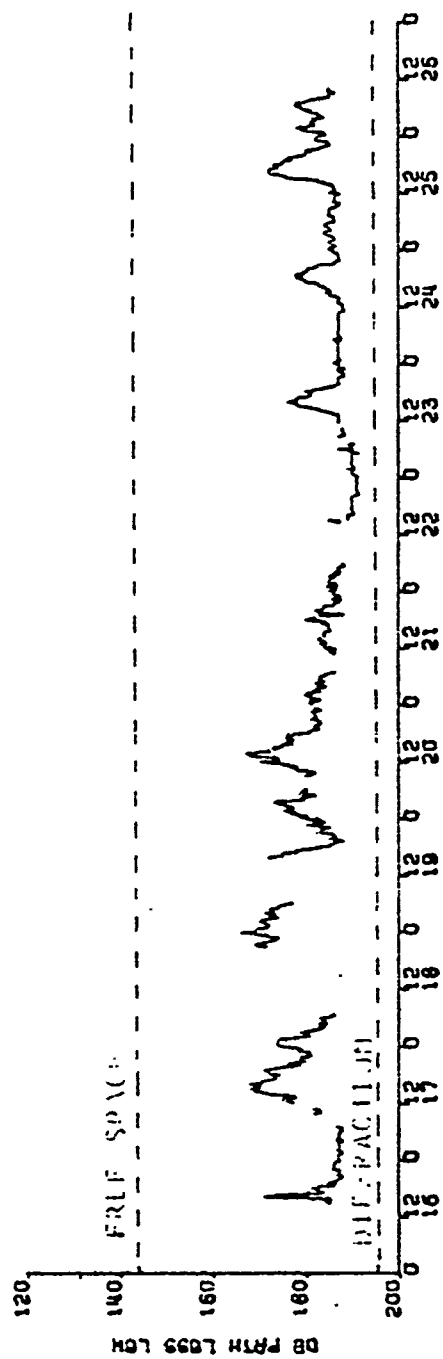
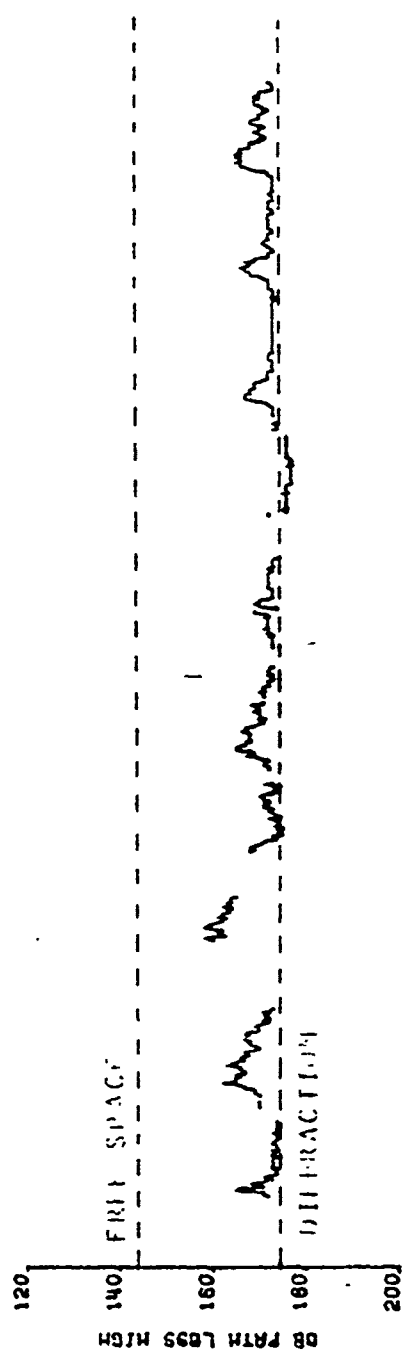


Figure 19. X BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

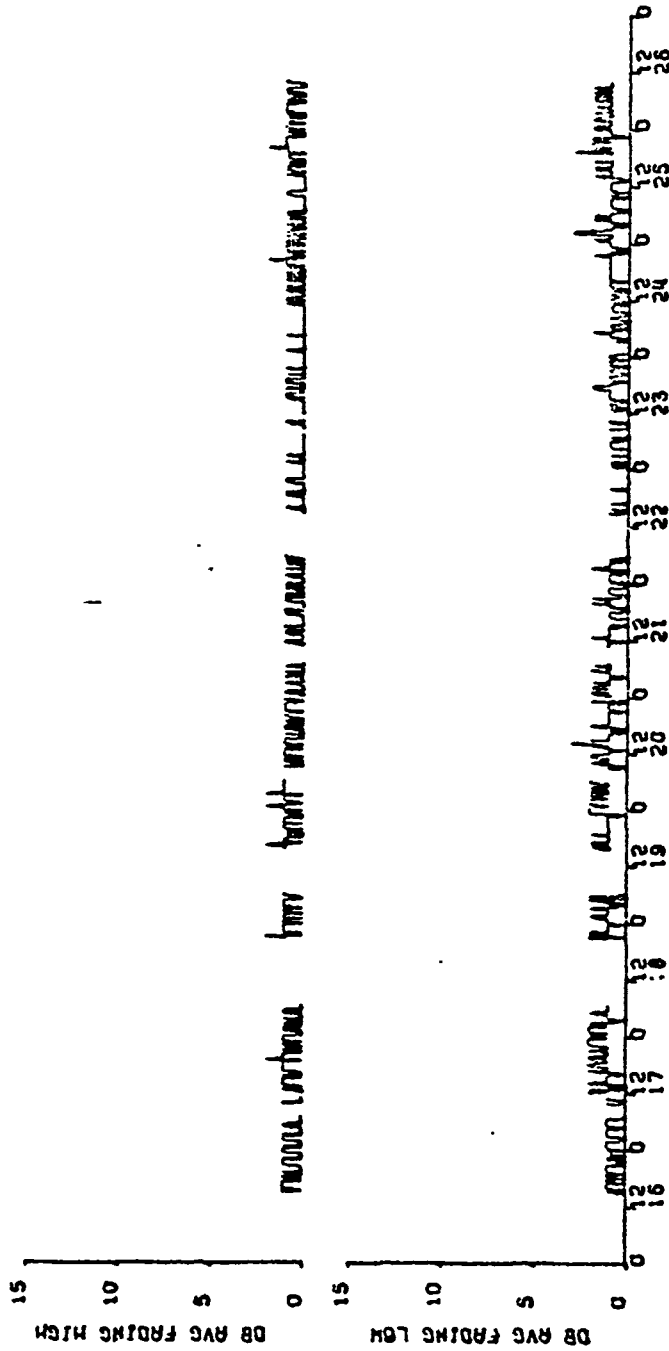


Figure 20. X BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

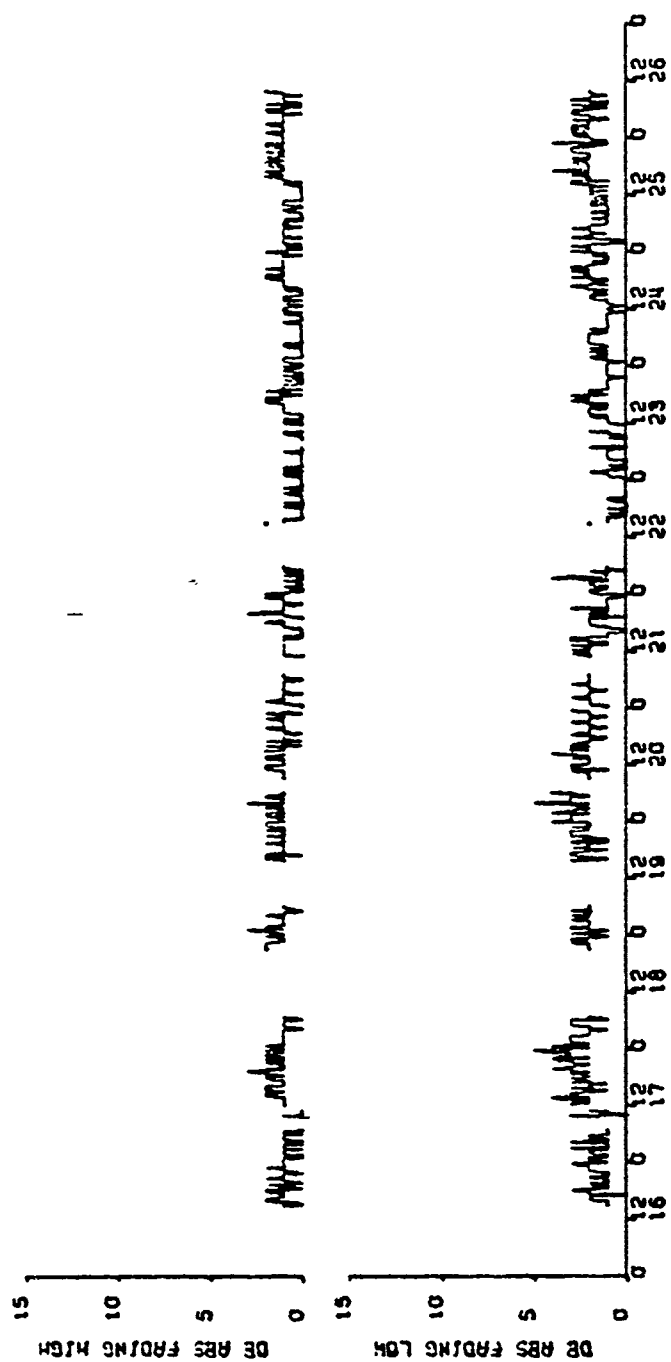


Figure 21. X BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

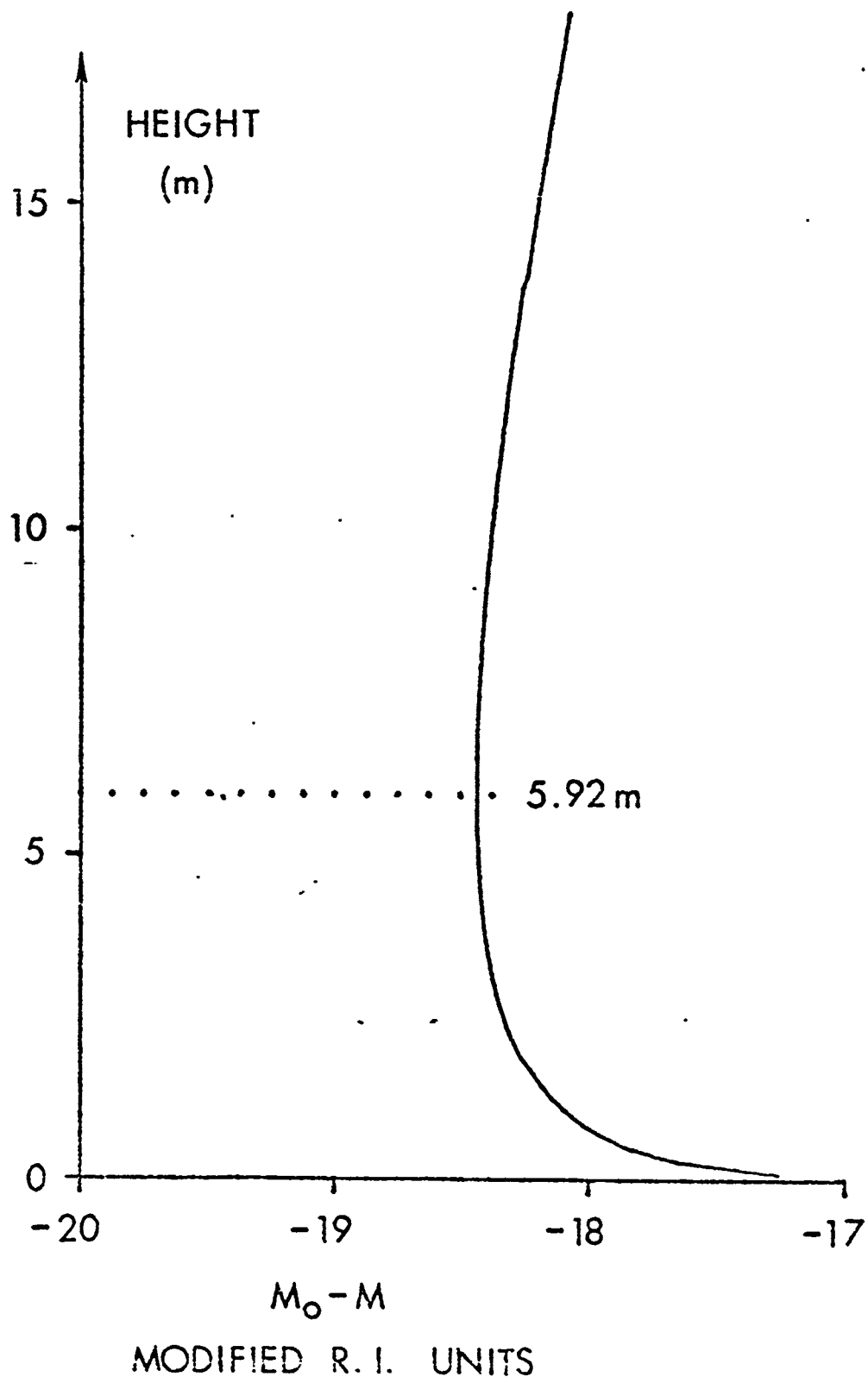


Figure 22

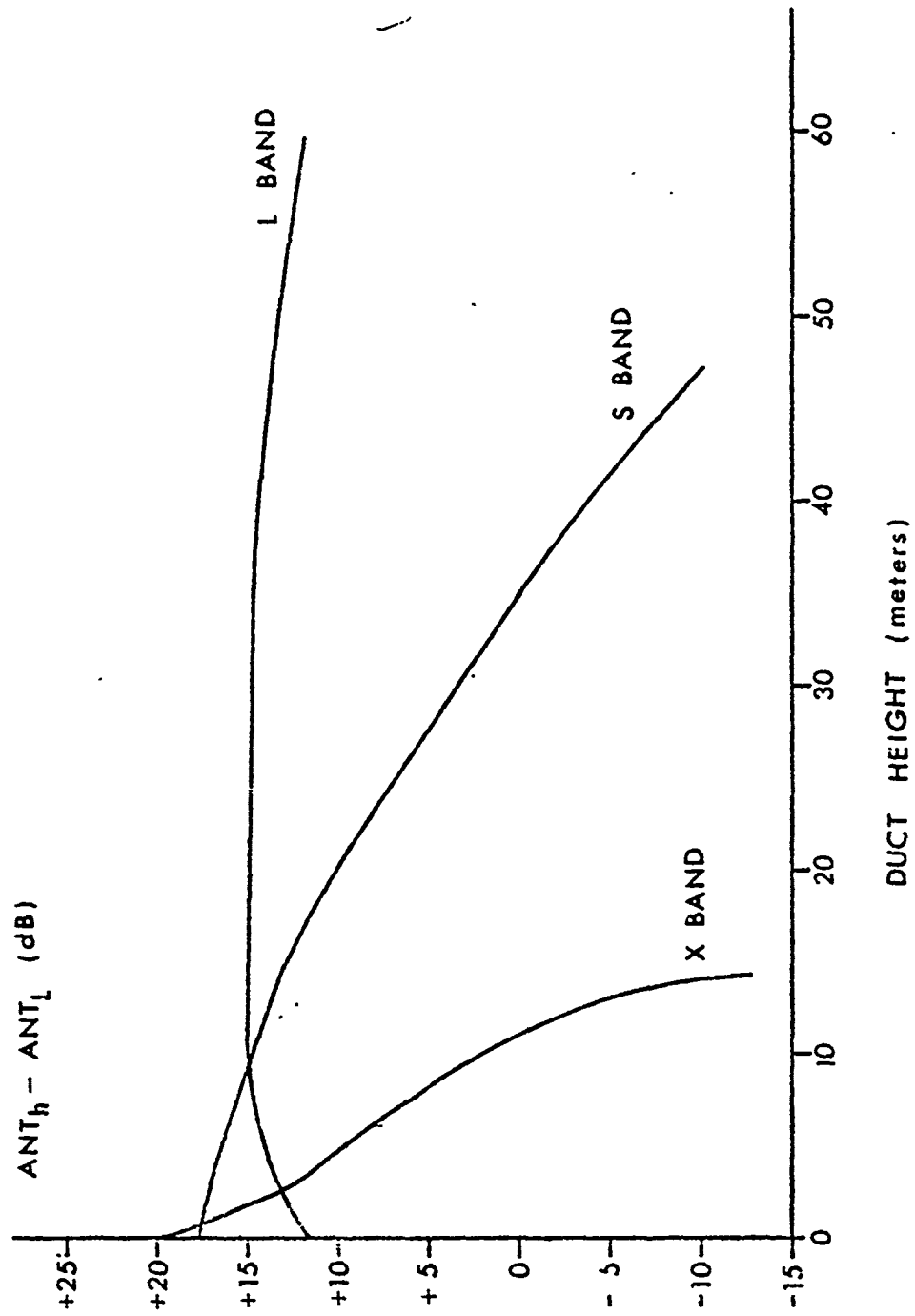


Figure 23. Calculated signal ratios versus duct height for 19.3 propagation link.

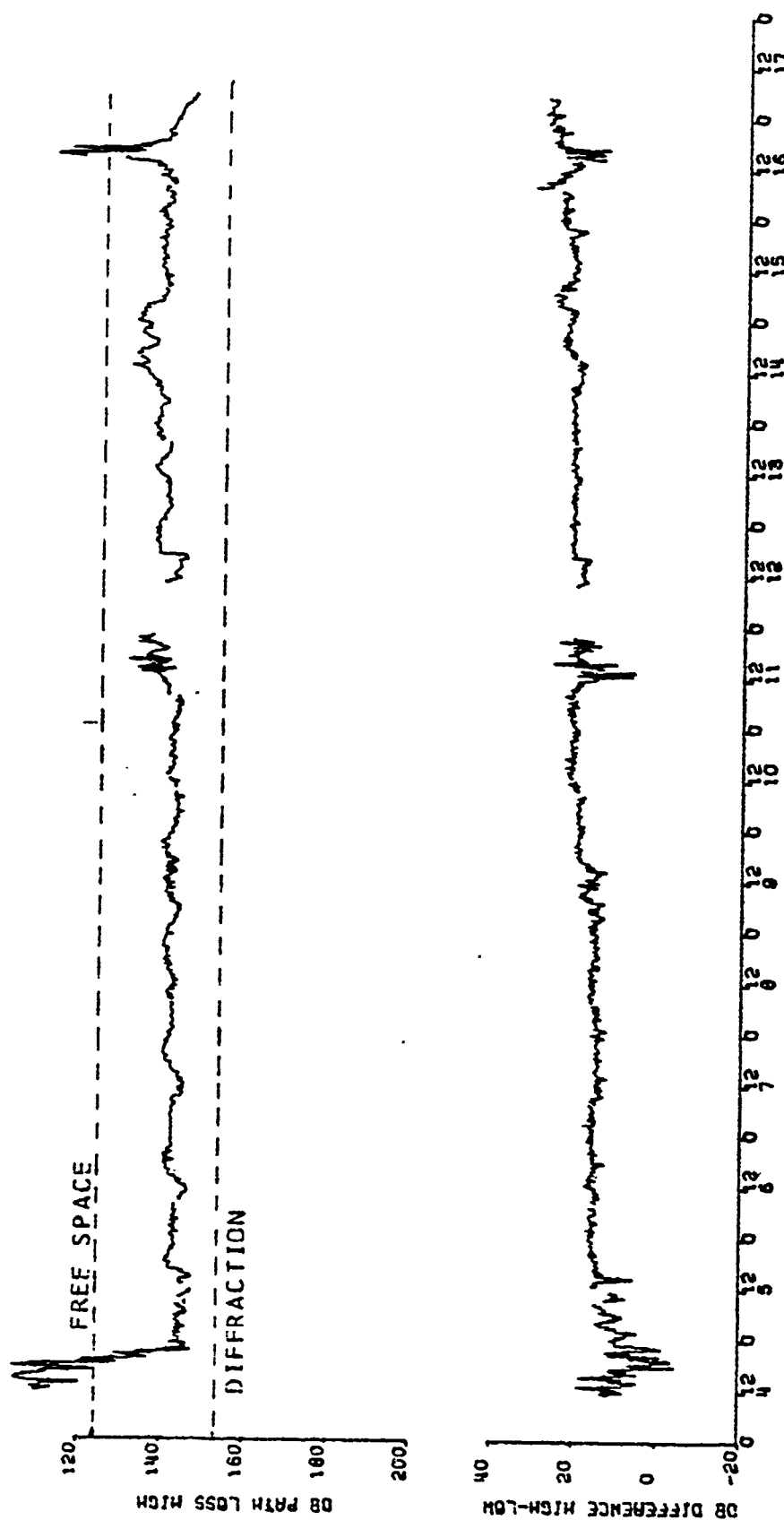


Figure 24. L BAND CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

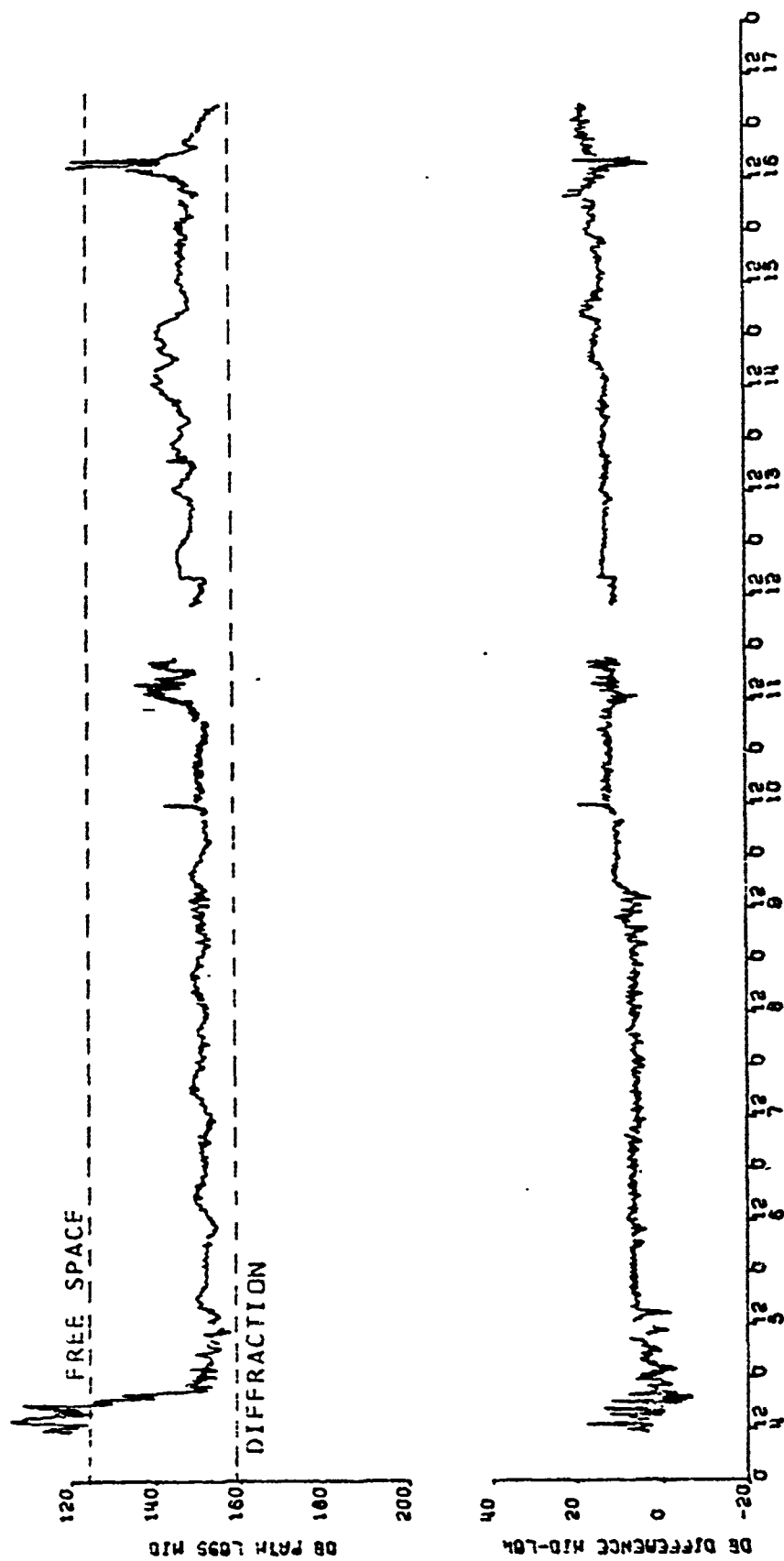


Figure 25. L PAPER CATALINA TO SAN CATHARINE ISLAND JUNE 1971

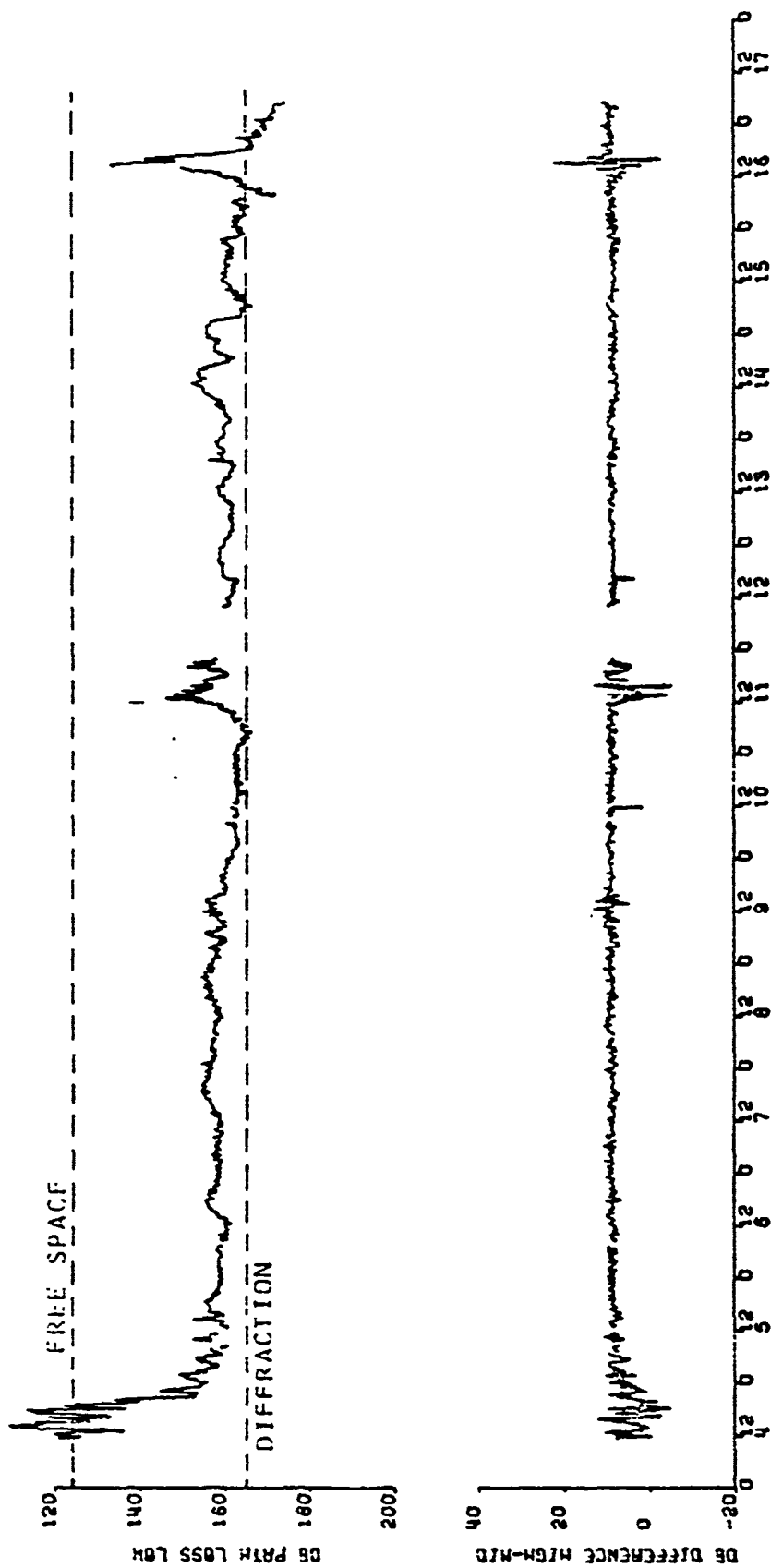


Figure 26. L. 1964) CAJALIGA TO SAN CLEMENTE ISLAND 8 NOVEMBER 1971

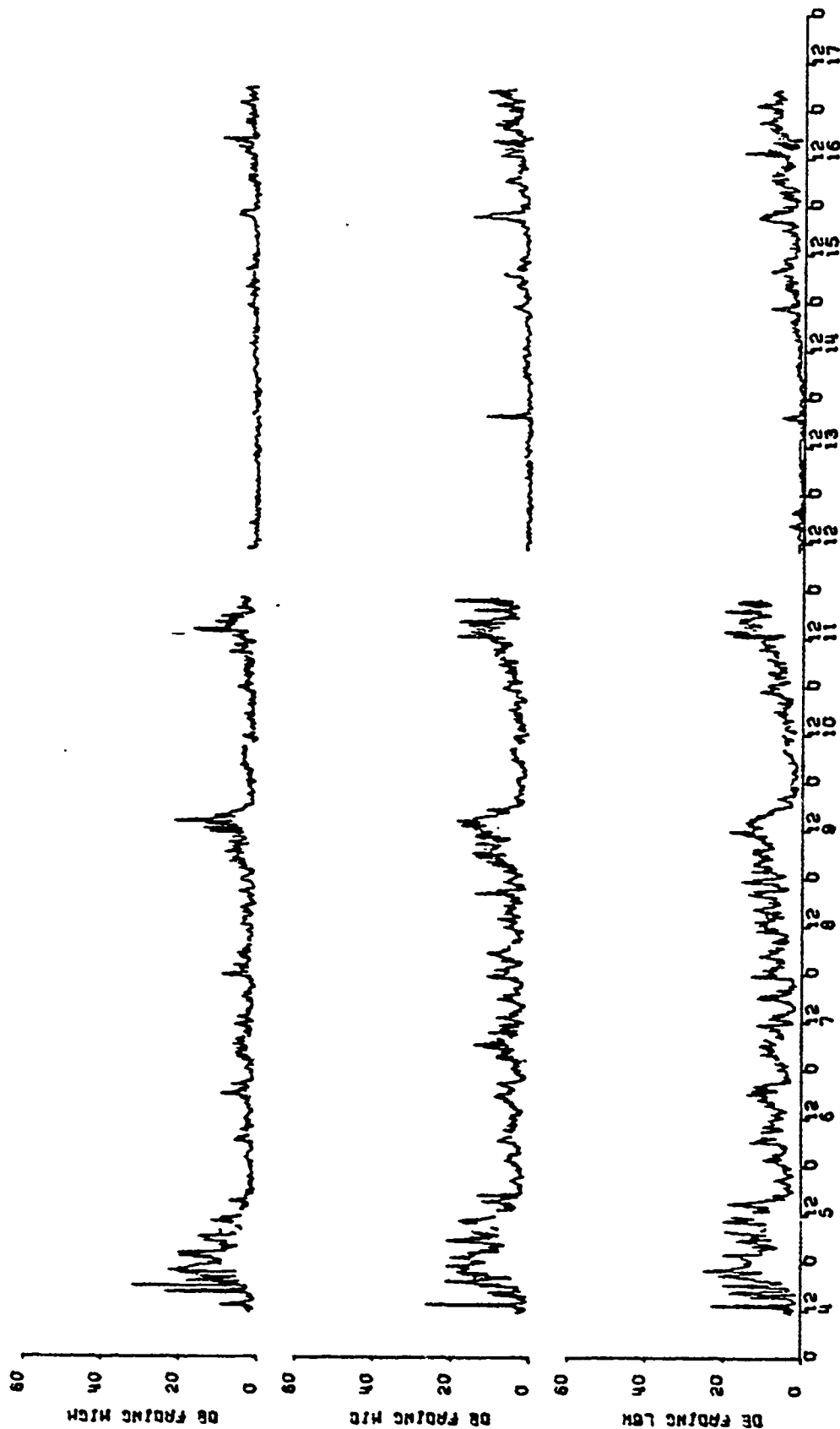


Figure 27. L BAY CATALINA IS. SAN CLEMENTE ISLAND DECEMBER 1971

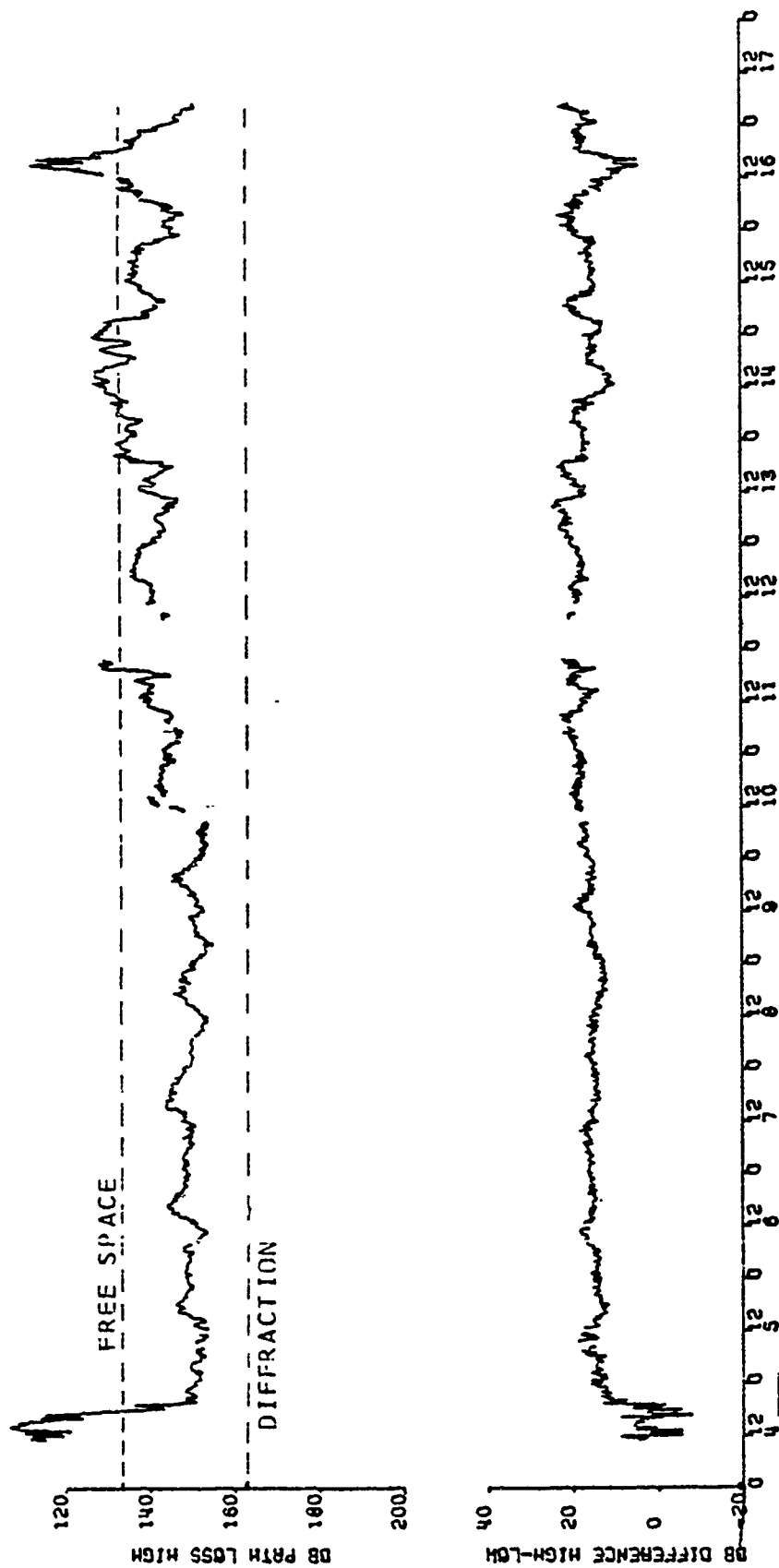


Figure 28. S BAND CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

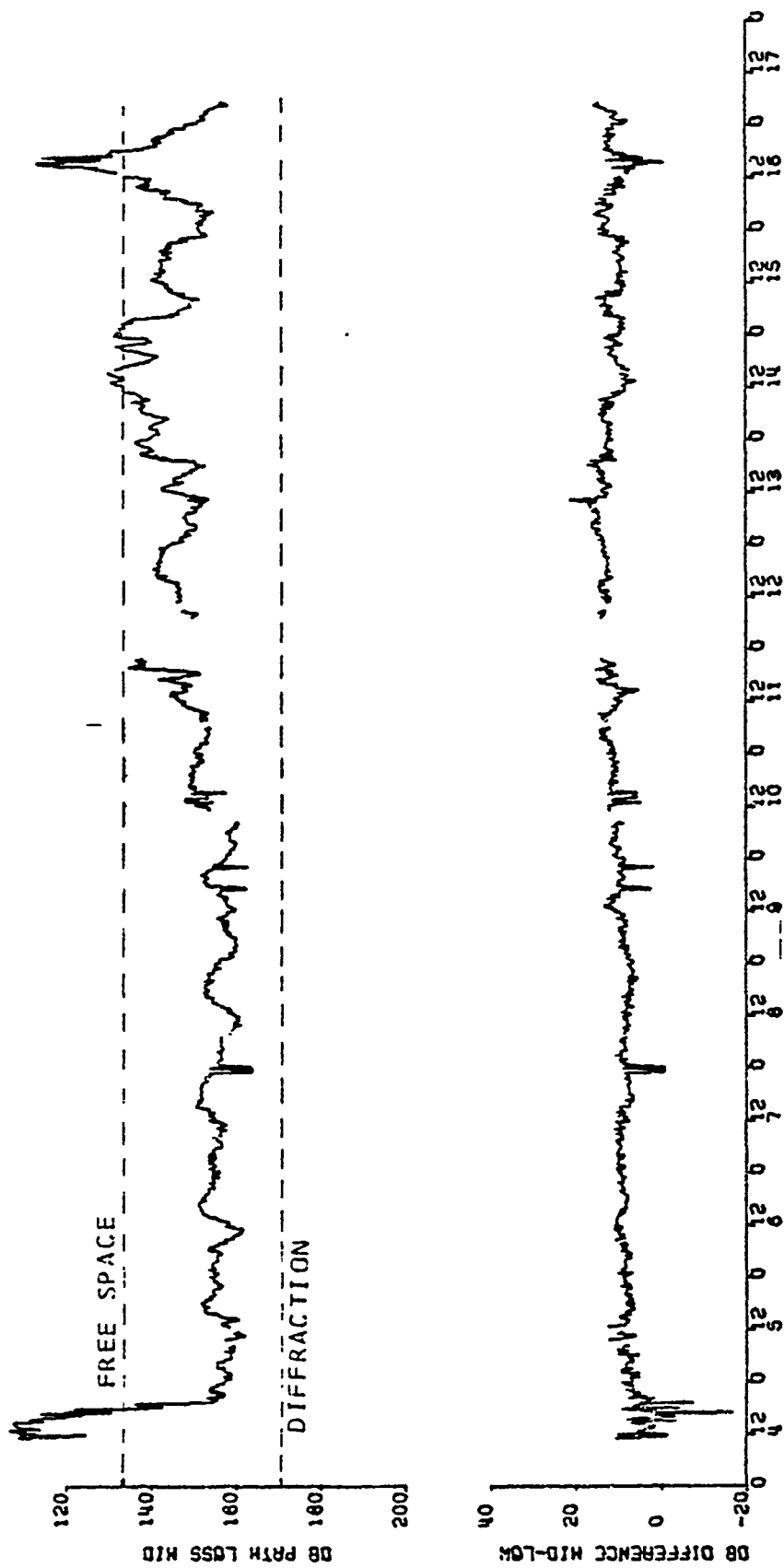


Figure 29. S BAND CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

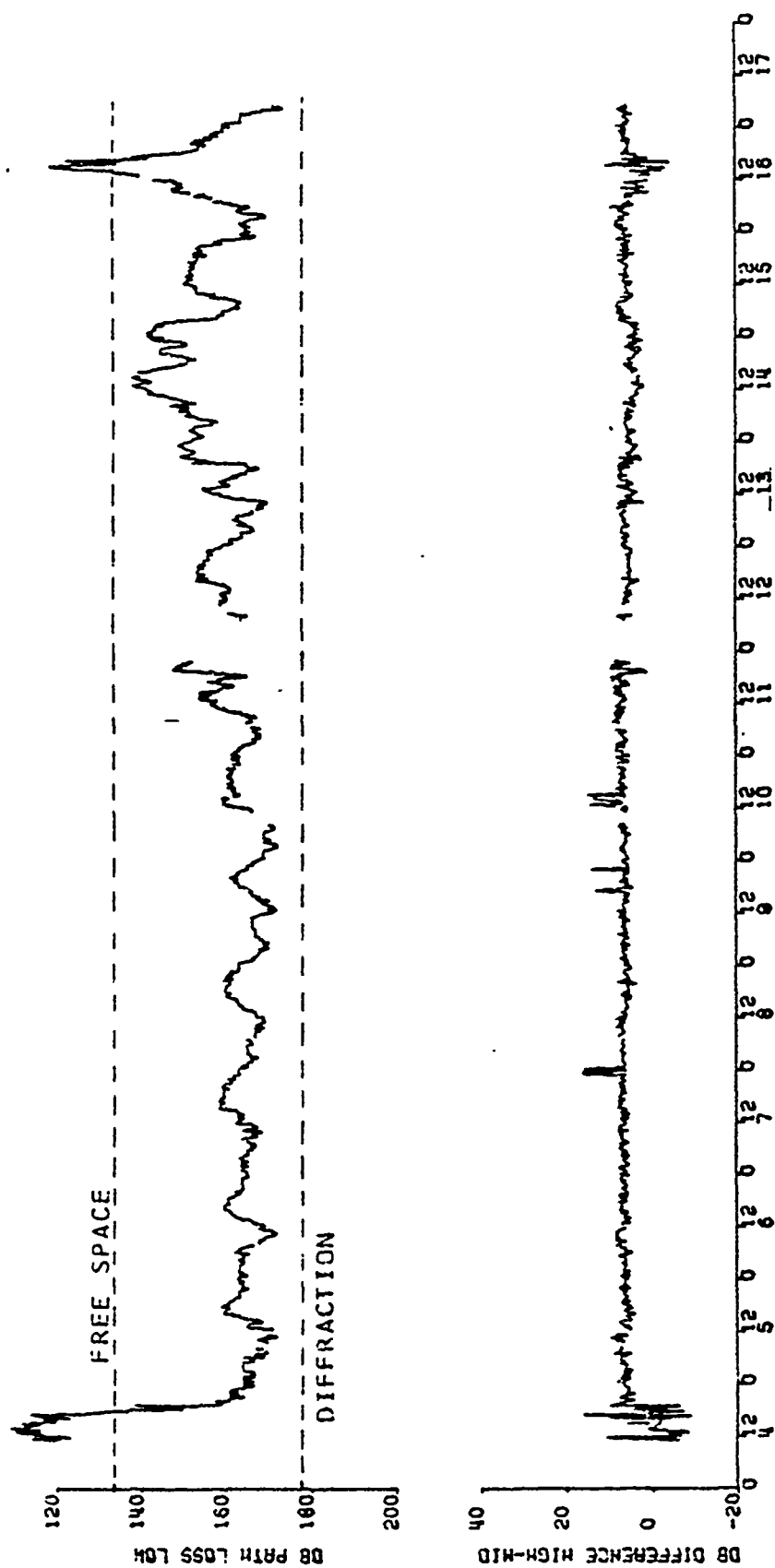


Figure 30. S BAND CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

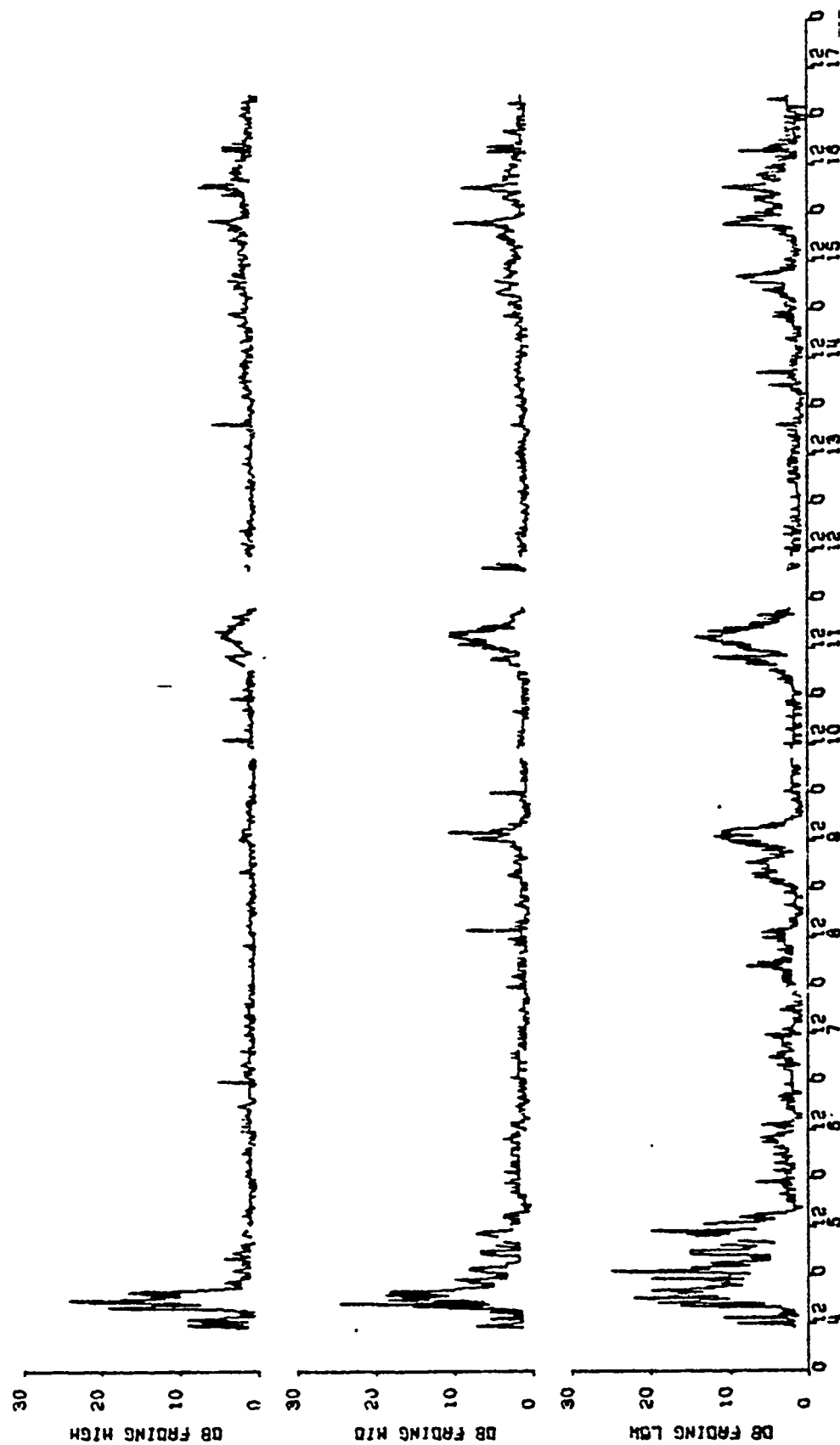


Figure 31. S BAND CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

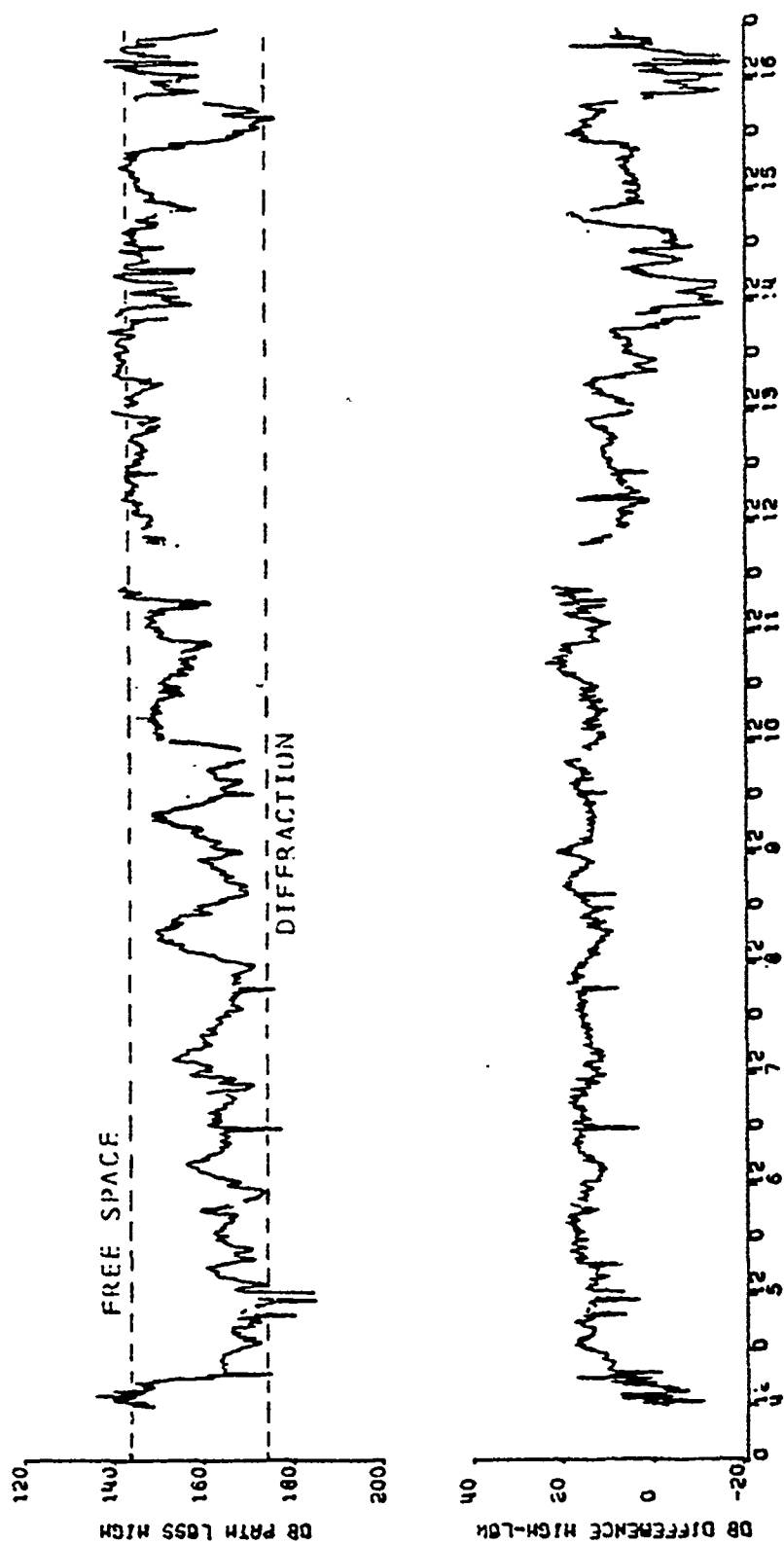


Figure 32. X HAND ... CATALINA TO SAN CLEMENTE ISLAND . NOVEMBER 1971

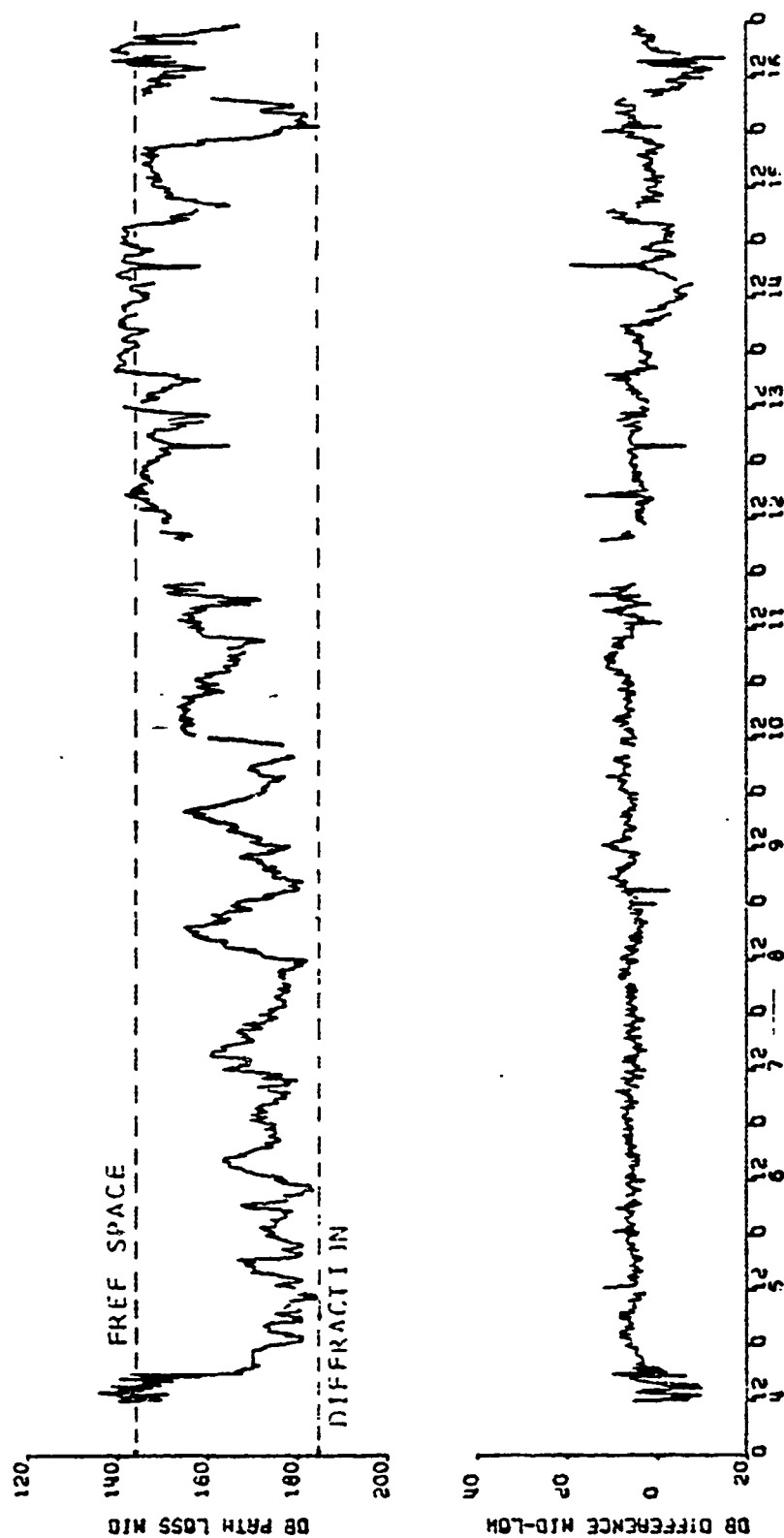


Figure 33. —X-BAND —CATALINA TO SAN CLEMENTE ISLAND— NOVEMBER 1971

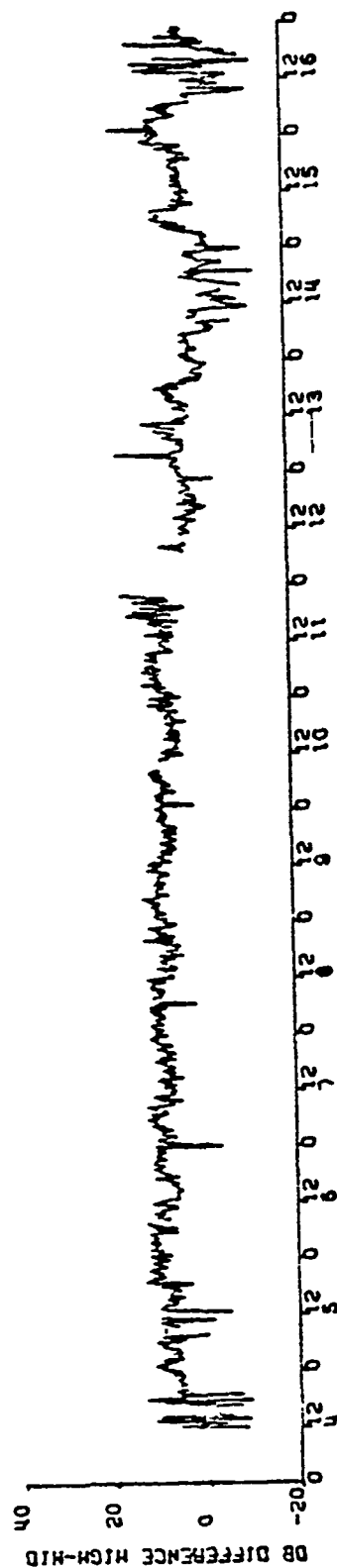
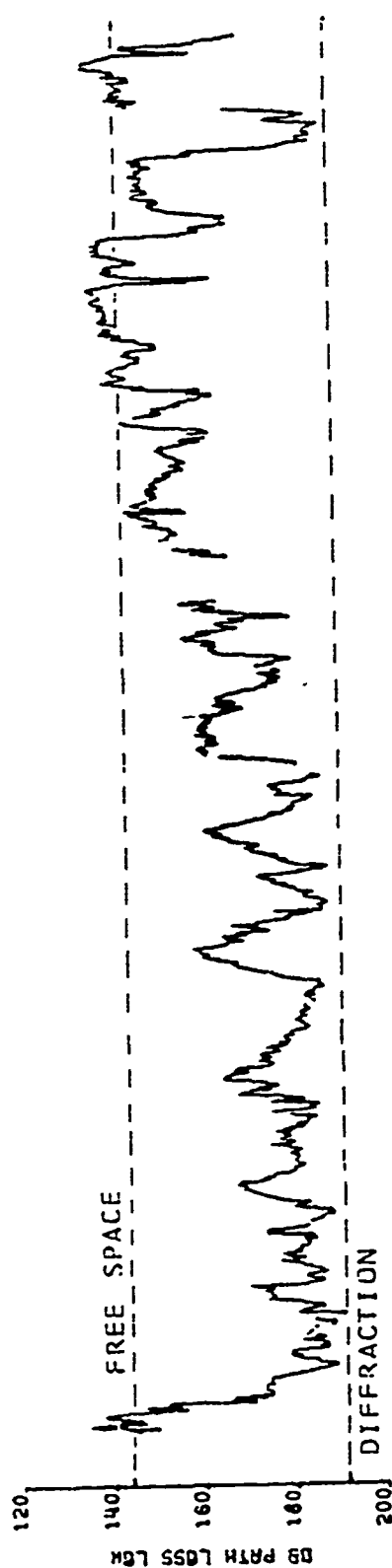


Figure 34...X-BAND. CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

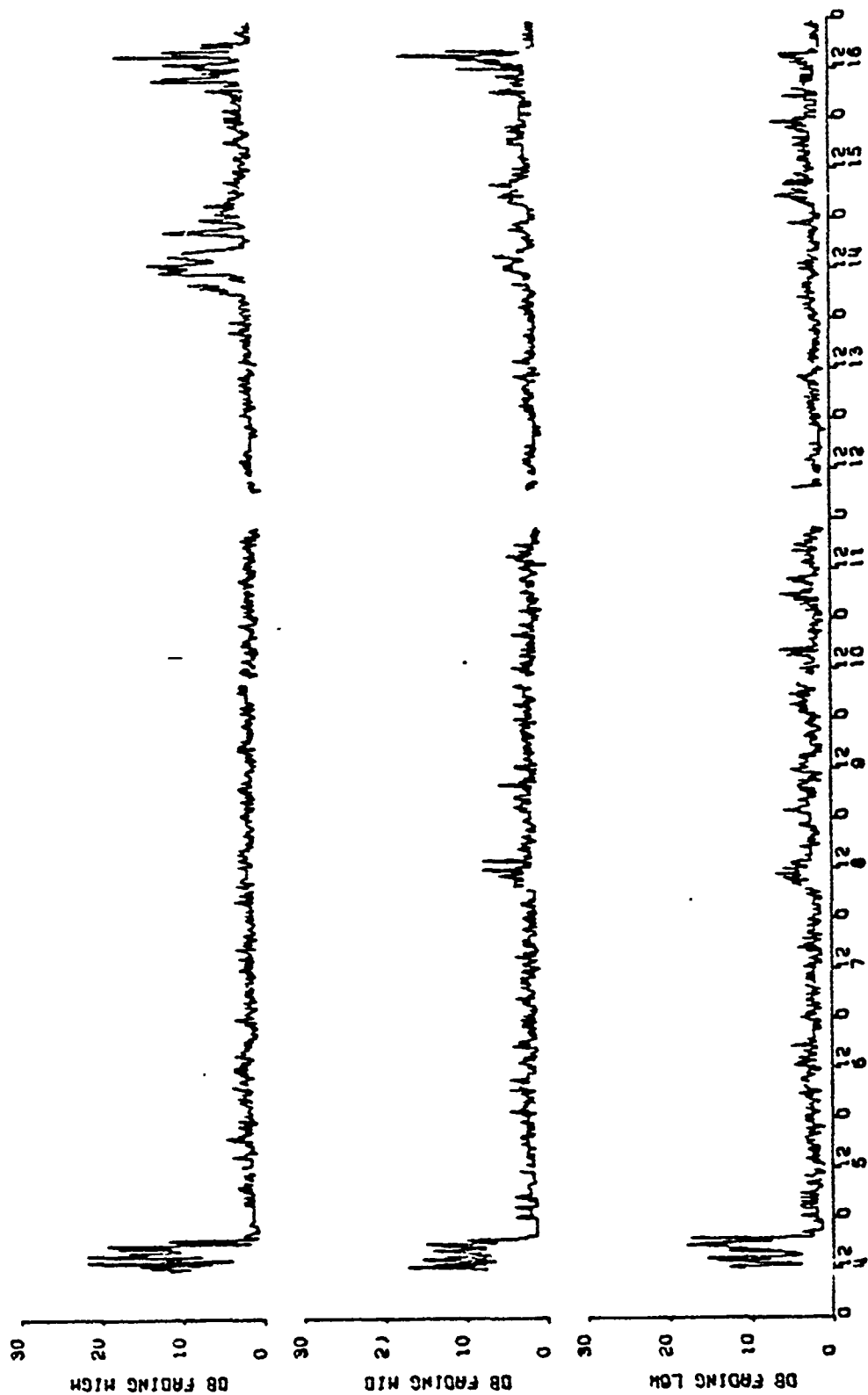


Figure 35. X. HANU ... CATALINA ID SAN CLEMENTE ISLAND . NOVEMBER 1971

## IX. TABLES

1. Performance characteristics of transmitter
2. Statistical presentation of July measurements for L-band
3. Statistical presentation of July measurements for S-band
4. Statistical presentation of July measurements for X-band
5. Statistical presentation of November measurements for L-band
6. Statistical presentation of November measurements for S-band
7. Statistical presentation of November measurements for X-band

## L BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

| HIGH-LOW             | AVG FADING HIGH | ABS FADING HIGH      |
|----------------------|-----------------|----------------------|
| 1.0 % > 20.0         | 0.0 % > 20.0    | 0.0 % > 20.0         |
| 33.8 % > 15.0        | 0.0 % > 15.0    | 1.2 % > 15.0         |
| 82.5 % > 10.0        | 0.3 % > 10.0    | 3.3 % > 10.0         |
| 92.5 % > 6.0         | 0.5 % > 8.0     | 5.2 % > 8.0          |
| 96.4 % > 3.0         | 1.9 % > 6.0     | 7.9 % > 6.0          |
| 98.2 % > 0.0         | 2.8 % > 5.0     | 10.4 % > 5.0         |
| 99.4 % > -3.0        | 4.7 % > 4.0     | 14.7 % > 4.0         |
| 99.6 % > -6.0        | 7.3 % > 3.0     | 20.5 % > 3.0         |
| 100.0 % > -10.0      | 13.6 % > 2.0    | 30.5 % > 2.0         |
| 100.0 % > -15.0      | 20.7 % > 1.0    | 52.2 % > 1.0         |
| 100.0 % > -20.0      |                 |                      |
| TOTAL ENTRIES = 2508 |                 | TOTAL ENTRIES = 2508 |

| AVG FADING LOW       | ABS FADING LOW |
|----------------------|----------------|
| 0.0 % > 20.0         | 0.4 % > 20.0   |
| 0.1 % > 15.0         | 4.1 % > 15.0   |
| 1.5 % > 10.0         | 44.1 % > 10.0  |
| 6.3 % > 3.0          | 68.2 % > 8.0   |
| 24.0 % > 6.0         | 85.6 % > 6.0   |
| 41.0 % > 5.0         | 92.0 % > 5.0   |
| 61.0 % > 4.0         | 96.2 % > 4.0   |
| 78.6 % > 3.0         | 98.5 % > 3.0   |
| 91.0 % > 2.0         | 99.6 % > 2.0   |
| 97.3 % > 1.0         | 99.8 % > 1.0   |
| TOTAL ENTRIES = 2503 |                |
| TOTAL ENTRIES = 2503 |                |

Table 2. Statistical Presentation of July Measurements for L-band

## S BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

| HIGH-LOW             |         | AVG FADING HIGH      |        | ABS FADING HIGH      |        |
|----------------------|---------|----------------------|--------|----------------------|--------|
| 0.0 %                | > 20.0  | 0.0 %                | > 20.0 | 0.0 %                | > 20.0 |
| 5.0 %                | > 15.0  | 3.0 %                | > 15.0 | 0.1 %                | > 15.0 |
| 96.7 %               | > 10.0  | 0.0 %                | > 10.0 | 0.2 %                | > 10.0 |
| 99.6 %               | > 6.0   | 0.0 %                | > 8.0  | 0.2 %                | > 8.0  |
| 100.0 %              | > 3.0   | 0.0 %                | > 6.0  | 0.2 %                | > 6.0  |
| 100.0 %              | > 0.0   | 0.1 %                | > 5.0  | 0.4 %                | > 5.0  |
| 100.0 %              | > -3.0  | 0.1 %                | > 4.0  | 0.5 %                | > 4.0  |
| 100.0 %              | > -6.0  | 0.1 %                | > 3.0  | 1.6 %                | > 3.0  |
| 100.0 %              | > -10.0 | 0.5 %                | > 2.0  | 4.8 %                | > 2.0  |
| 100.0 %              | > -15.0 | 4.1 %                | > 1.0  | 13.5 %               | > 1.0  |
| 100.0 %              | > -20.0 |                      |        |                      |        |
| TOTAL ENTRIES = 2550 |         | TOTAL ENTRIES = 2554 |        | TOTAL ENTRIES = 2554 |        |

| AVG FADING LOW       |        | ABS FADING LOW       |        |
|----------------------|--------|----------------------|--------|
| 0.0 %                | > 20.0 | 0.0 %                | > 20.0 |
| 0.0 %                | > 15.0 | 0.2 %                | > 15.0 |
| 0.0 %                | > 10.0 | 4.0 %                | > 10.0 |
| 0.0 %                | > 8.0  | 7.3 %                | > 8.0  |
| 0.4 %                | > 6.0  | 11.3 %               | > 6.0  |
| 1.0 %                | > 5.0  | 13.4 %               | > 5.0  |
| 3.7 %                | > 4.0  | 20.1 %               | > 4.0  |
| 7.1 %                | > 3.0  | 33.3 %               | > 3.0  |
| 11.9 %               | > 2.0  | 54.4 %               | > 2.0  |
| 18.3 %               | > 1.0  | 83.7 %               | > 1.0  |
| TOTAL ENTRIES = 2555 |        | TOTAL ENTRIES = 2555 |        |

Table 3. Statistical Presentation of July Measurements for S-band

# X BAND CATALINA TO SAN CLEMENTE ISLAND JULY 1971

| HIGH-LOW             | AVG FADING HIGH |                 | ABS FADING HIGH |        |
|----------------------|-----------------|-----------------|-----------------|--------|
| 0.0 % > 20.0         | 0.0 %           | > 20.0          | 0.0 %           | > 20.0 |
| 0.0 % > 15.0         | 0.0 %           | > 15.0          | 0.0 %           | > 15.0 |
| 73.4 % > 10.0        | 0.0 %           | > 10.0          | 0.0 %           | > 10.0 |
| 92.1 % > 6.0         | 0.0 %           | > 8.0           | 0.0 %           | > 8.0  |
| 94.1 % > 3.0         | 0.0 %           | > 6.0           | 0.0 %           | > 6.0  |
| 100.0 % > 0.0        | 0.0 %           | > 5.0           | 0.1 %           | > 5.0  |
| 100.0 % > -3.0       | 0.0 %           | > 4.0           | 0.2 %           | > 4.0  |
| 100.0 % > -6.0       | 0.0 %           | > 3.0           | 0.3 %           | > 3.0  |
| 100.0 % > -10.0      | 0.0 %           | > 2.0           | 0.9 %           | > 2.0  |
| 100.0 % > -15.0      | 1.1 %           | > 1.0           | 14.7 %          | > 1.0  |
| 100.0 % > -20.0      |                 |                 |                 |        |
| TOTAL ENTRIES = 2258 |                 | TOTAL ENTRIES = |                 |        |

| AVG FADING LOW       | ABS FADING LOW |                      |
|----------------------|----------------|----------------------|
| 0.0 % > 20.0         | 0.0 %          | > 20.0               |
| 0.0 % > 15.0         | 0.0 %          | > 15.0               |
| 0.0 % > 10.0         | 0.0 %          | > 10.0               |
| 0.0 % > 8.0          | 0.0 %          | > 8.0                |
| 0.0 % > 6.0          | 0.1 %          | > 6.0                |
| 0.0 % > 5.0          | 0.2 %          | > 5.0                |
| 0.0 % > 4.0          | 0.4 %          | > 4.0                |
| 0.1 % > 3.0          | 4.7 %          | > 3.0                |
| 0.9 % > 2.0          | 22.5 %         | > 2.0                |
| 16.5 % > 1.0         | 54.2 %         | > 1.0                |
| TOTAL ENTRIES = 2258 |                | TOTAL ENTRIES = 2258 |

Table 4. Statistical Presentation of July Measurements for X-band

L BAND CAYMANA TO SAN CLEMENTE ISLAND NOVEMBER 1971

| HIGH-LOW             |   |          | MID-LOW              |   |          | HIGH-MID             |   |          |
|----------------------|---|----------|----------------------|---|----------|----------------------|---|----------|
| 42.1                 | > | 20.0 DB  | 0.4                  | > | 20.0 DB  | 0.1                  | > | 20.0 DB  |
| 77.7                 | > | 15.0 DB  | 12.0                 | > | 15.0 DB  | 0.1                  | > | 15.0 DB  |
| 94.9                 | > | 10.0 DB  | 55.5                 | > | 10.0 DB  | 4.3                  | > | 10.0 DB  |
| 98.3                 | > | 6.0 DB   | 82.1                 | > | 6.0 DB   | 94.2                 | > | 6.0 DB   |
| 99.2                 | > | 3.0 DB   | 95.9                 | > | 3.0 DB   | 97.4                 | > | 3.0 DB   |
| 99.6                 | > | 0.0 DB   | 98.0                 | > | 0.0 DB   | 99.0                 | > | 0.0 DB   |
| 99.7                 | > | -3.0 DB  | 99.5                 | > | -3.0 DB  | 99.6                 | > | -3.0 DB  |
| 100.0                | > | -6.0 DB  | 99.8                 | > | -6.0 DB  | 100.0                | > | -6.0 DB  |
| 100.0                | > | -10.0 DB | 100.0                | > | -10.0 DB | 100.0                | > | -10.0 DB |
| 100.0                | > | -15.0 DB | 100.0                | > | -15.0 DB | 100.0                | > | -15.0 DB |
| 100.0                | > | -20.0 DB | 100.0                | > | -20.0 DB | 100.0                | > | -20.0 DB |
| TOTAL ENTRIES = 1128 |   |          | TOTAL ENTRIES = 1133 |   |          | TOTAL ENTRIES = 1127 |   |          |

| FADING HIGH          |   |          | FADING MIDDLE        |   |          | FADING LOW           |   |          |
|----------------------|---|----------|----------------------|---|----------|----------------------|---|----------|
| 0.4                  | > | 20.0 DB  | 0.4                  | > | 20.0 DB  | 0.4                  | > | 20.0 DB  |
| 1.5                  | > | 15.0 DB  | 2.7                  | > | 15.0 DB  | 3.1                  | > | 15.0 DB  |
| 4.9                  | > | 10.0 DB  | 10.1                 | > | 10.0 DB  | 15.9                 | > | 10.0 DB  |
| 6.1                  | > | 6.0 DB   | 15.9                 | > | 6.0 DB   | 29.3                 | > | 6.0 DB   |
| 6.6                  | > | 3.0 DB   | 26.0                 | > | 3.0 DB   | 44.4                 | > | 3.0 DB   |
| 13.2                 | > | 0.0 DB   | 32.0                 | > | 0.0 DB   | 50.7                 | > | 0.0 DB   |
| 16.4                 | > | -3.0 DB  | 43.7                 | > | -3.0 DB  | 60.1                 | > | -3.0 DB  |
| 30.5                 | > | -6.0 DB  | 57.0                 | > | -6.0 DB  | 70.1                 | > | -6.0 DB  |
| 52.0                 | > | -9.0 DB  | 71.6                 | > | -9.0 DB  | 78.3                 | > | -9.0 DB  |
| 84.6                 | > | -12.0 DB | 92.9                 | > | -12.0 DB | 92.2                 | > | -12.0 DB |
| TOTAL ENTRIES = 1132 |   |          | TOTAL ENTRIES = 1134 |   |          | TOTAL ENTRIES = 1135 |   |          |

Table 5. Statistical Presentation of November Measurements for L-band



## X BAND CATALINA TO SAN CLEMENTE ISLAND NOVEMBER 1971

| HIGH-LOW             |            | MID-LOW              |            | HIGH-MID             |            |
|----------------------|------------|----------------------|------------|----------------------|------------|
| 1.1 %                | > 20.0 DB  | 0.0 %                | > 20.0 DB  | 0.0 %                | > 20.0 DB  |
| 27.0 %               | > 15.0 DB  | 0.2 %                | > 15.0 DB  | 0.4 %                | > 15.0 DB  |
| 65.4 %               | > 10.0 DB  | 2.2 %                | > 10.0 DB  | 14.4 %               | > 10.0 DB  |
| 75.1 %               | > 6.0 DB   | 34.1 %               | > 6.0 DB   | 57.2 %               | > 6.0 DB   |
| 84.1 %               | > 3.0 DB   | 78.1 %               | > 3.0 DB   | 75.1 %               | > 3.0 DB   |
| 89.1 %               | > 0.0 DB   | 89.3 %               | > 0.0 DB   | 85.6 %               | > 0.0 DB   |
| 92.1 %               | > -3.0 DB  | 94.0 %               | > -3.0 DB  | 93.3 %               | > -3.0 DB  |
| 95.2 %               | > -6.0 DB  | 97.8 %               | > -6.0 DB  | 96.7 %               | > -6.0 DB  |
| 97.3 %               | > -10.0 DB | 99.5 %               | > -10.0 DB | 99.1 %               | > -10.0 DB |
| 99.5 %               | > -15.0 DB | 99.9 %               | > -15.0 DB | 100.0 %              | > -15.0 DB |
| 100.0 %              | > -20.0 DB | 100.0 %              | > -20.0 DB | 100.0 %              | > -20.0 DB |
| TOTAL ENTRIES = 1107 |            | TOTAL ENTRIES = 1107 |            | TOTAL ENTRIES = 1107 |            |

| FADING HIGH          |           | FADING MIDDLE        |           | FADING LOW           |           |
|----------------------|-----------|----------------------|-----------|----------------------|-----------|
| 0.2 %                | > 20.0 DB | 0.0 %                | > 20.0 DB | 0.0 %                | > 20.0 DB |
| 0.7 %                | > 15.0 DB | 0.4 %                | > 15.0 DB | 0.5 %                | > 15.0 DB |
| 3.4 %                | > 10.0 DB | 1.9 %                | > 10.0 DB | 1.6 %                | > 10.0 DB |
| 5.0 %                | > 8.0 DB  | 2.3 %                | > 8.0 DB  | 1.7 %                | > 8.0 DB  |
| 6.5 %                | > 6.0 DB  | 3.9 %                | > 6.0 DB  | 2.7 %                | > 6.0 DB  |
| 7.2 %                | > 5.0 DB  | 4.6 %                | > 5.0 DB  | 4.2 %                | > 5.0 DB  |
| 10.2 %               | > 4.0 DB  | 7.3 %                | > 4.0 DB  | 8.1 %                | > 4.0 DB  |
| 16.5 %               | > 3.0 DB  | 19.6 %               | > 3.0 DB  | 28.2 %               | > 3.0 DB  |
| 39.5 %               | > 2.0 DB  | 54.4 %               | > 2.0 DB  | 67.5 %               | > 2.0 DB  |
| 92.7 %               | > 1.0 DB  | 98.5 %               | > 1.0 DB  | 99.7 %               | > 1.0 DB  |
| TOTAL ENTRIES = 1109 |           | TOTAL ENTRIES = 1109 |           | TOTAL ENTRIES = 1108 |           |

Table 7. Statistical Presentation of November Measurements for X-band

## X. APPENDIX (Meteorological Data)

The purpose of the measurement program described in this report was to provide reliable data to permit prediction of antenna performance in the oceanic evaporation duct for various antenna heights and frequencies. Therefore, extensive measurements were done in various seasons without the attempt to correlate meteorological data with radio measurements obtained simultaneously (this has been done successfully and is described in reference 1). However, it is the purpose of this report to document all pertinent data. For this reason, meteorological data available for the periods of the radio measurements are presented without further analysis. The meteorological data are published in a separate volume which is available upon request.\* The meteorological data consist of two refractive index profiles obtained with airborne microwave refractometers on 11 November 1971 and surface weather observations from San Clemente Island. In general, the meteorology during the July measurement period was characterized by thermal stability in the lower atmosphere with an almost continuous stratus cloud deck. The November measurement encountered the whole range of meteorological conditions from strong subsidence and advection inversions (Santa Ana condition) to neutral and unstable atmospheric conditions. The boat measurements covering a period of November 1970 to April 1971 likewise encountered the whole spectrum of weather conditions found in this area.

---

\* Meteorological data is now included in this volume--see following pages.

### Meteorological Data

Meteorological data available for the July 1971 and November 1971 measurement periods are presented without further analysis. The meteorological data consist of two refractive index profiles obtained with airborne microwave refractometers on 11 November 1971 and surface weather observations from San Clemente Island. In general, the meteorology during the July measurement period was characterized by thermal stability in the lower atmosphere with an almost continuous stratus cloud deck. The November measurement encountered the whole range of meteorological conditions from strong subsidence and advection inversions (Santa Ana condition) to neutral and unstable atmospheric conditions. The boat measurements covering a period of November 1970 to April 1971 likewise encountered the whole spectrum of weather conditions found in this area.

## REFRACTIVE INDEX PROFILES

24 November 1971

# REFRACTIVE INDEX PROFILE

DATE 11 NOVEMBER 1971

67

TIME 1030 PST

LOCATION 5 NM. S of  
SANTA CATALINA IS.

HEIGHT (METERS)

1800

1600

1400

1200

1000

800

600

400

200

200

220

240

260

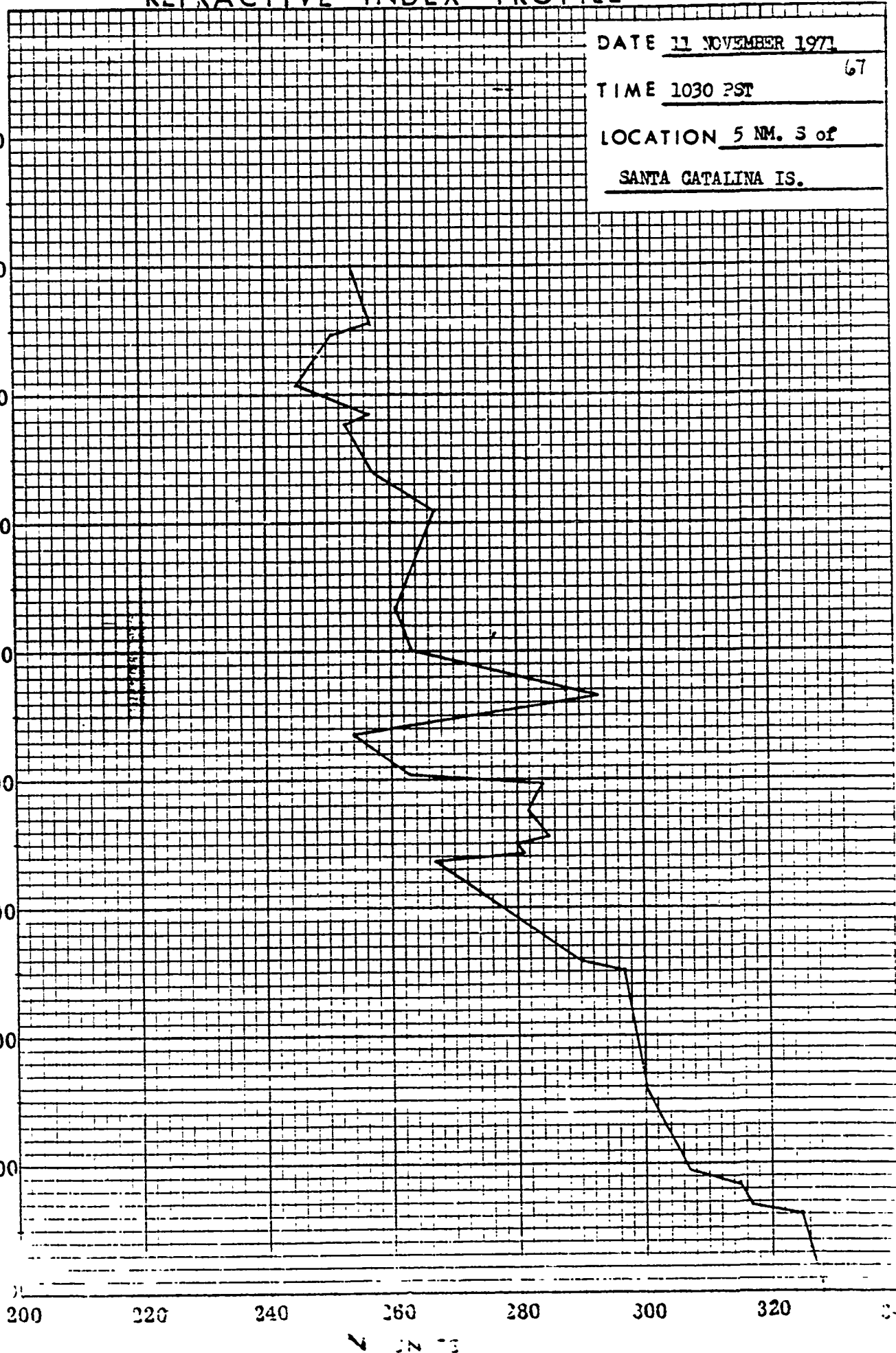
280

300

320

340

WAVELENGTH (METERS)

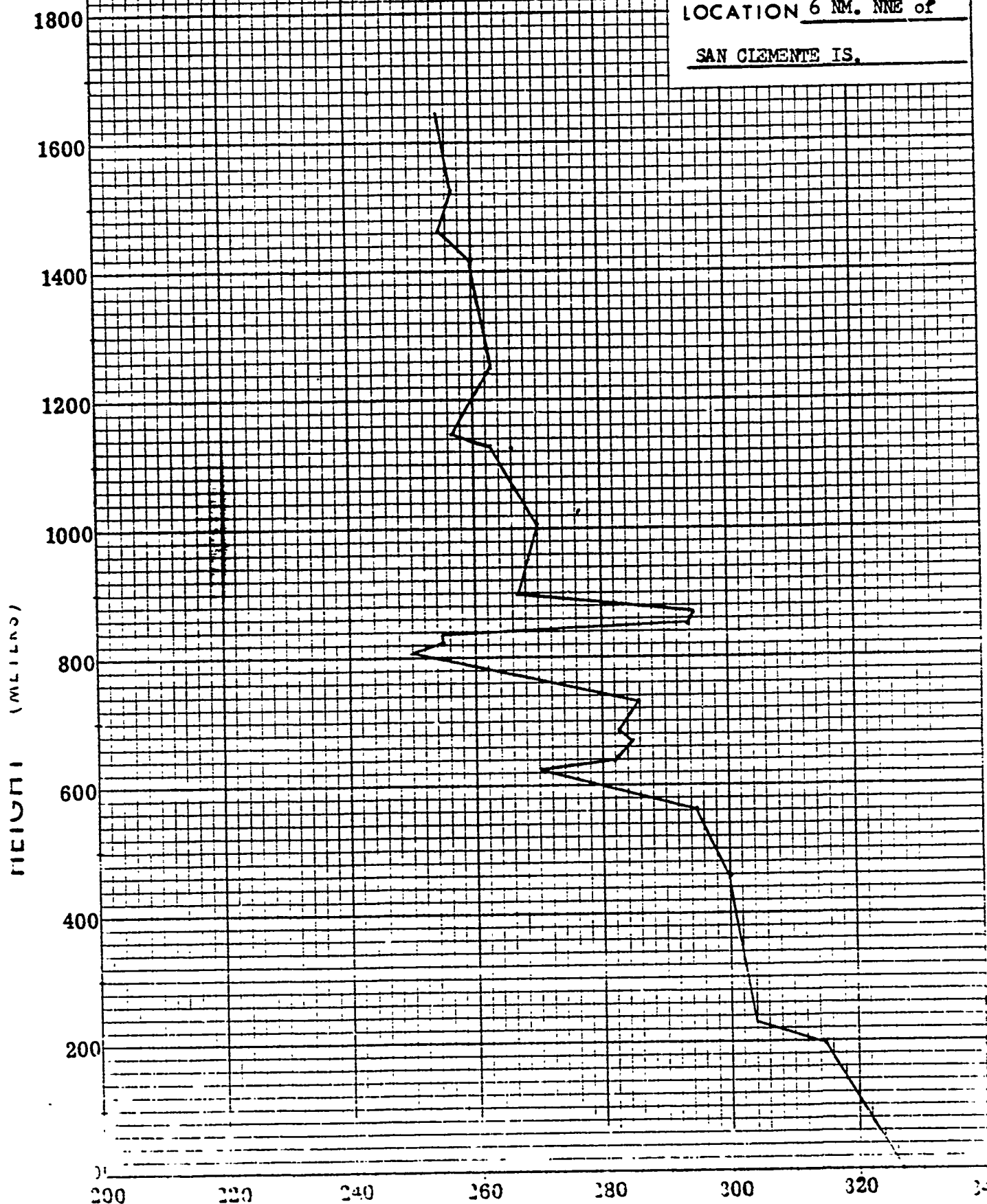


# REFRACTIVE INDEX PROFILE

DATE 11 NOVEMBER 1971<sup>68</sup>

TIME 1010 PST

LOCATION 6 NM. NNE of  
SAN CLEMENTE IS.



## SURFACE WEATHER OBSERVATIONS

16-26 July 1971

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

STATION

NAUSEA SAN CLEMENTE IS.

70

DATE

16 JULY 1971

| Type | Time (LST) | Sky and ceiling (Summers of feet) | visibility (Statute Miles) |       | Weather and obstructions to vision | Sea level press. (HPa.) | Temp. (°F) | Dew pt. (°F) | Wind      |             |                     | Altimeter setting (Inch.) | Remarks and supplemental coded data | Observer's initials |
|------|------------|-----------------------------------|----------------------------|-------|------------------------------------|-------------------------|------------|--------------|-----------|-------------|---------------------|---------------------------|-------------------------------------|---------------------|
|      |            |                                   | Surface                    | Tower |                                    |                         |            |              | Direction | Speed (Kts) | Character and gusts |                           |                                     |                     |
| (1)  | (2)        | (3)                               | (4)                        | (5)   | (6)                                | (7)                     | (8)        | (9)          | (10)      | (11)        | (12)                | (13)                      | (14)                                | (15)                |
| R    | 0259       | E 1/2                             | 3                          | 4     | U                                  | 105                     | 24         | 4            | 24        | 00          | 00                  | 29                        | 602 16//                            | LH                  |
| R    | 0300       | E 1/2                             | 3                          | 4     | U                                  | 105                     | 25         | 50           | 20        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 0301       | E 1/2                             | 3                          | 4     | U                                  | 105                     | 25         | 50           | 20        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 0302       | E 1/2                             | 3                          | 4     | U                                  | 105                     | 25         | 50           | 20        | 00          | 00                  | 29                        | 400 16// 62                         | LH                  |
| R    | 0400       | E 1/2                             | 3                          | 4     | F                                  | 113                     | 29         | 59           | 00        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 0500       | E 5/8                             | 3                          | 4     | F                                  | 119                     | 22         | 57           | 27        | 02          | 00                  | 29                        |                                     | LH                  |
| R    | 0600       | E 5/8                             | 3                          | 4     | F                                  | 119                     | 62         | 58           | 28        | 02          | 00                  | 29                        | 112 16//                            | LH                  |
| R    | 0700       | E 6/8                             | 3                          | 4     | F                                  | 119                     | 65         | 60           | 00        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 0705       | E 6/8                             | 3                          | 4     | F                                  | 124                     | 67         | 60           | 00        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 0750       | A 5/8                             | 3                          | 4     | F                                  | 122                     | 66         | 59           | 27        | 04          | 00                  | 29                        | 210 16// 62                         | LH                  |
| R    | 0858       | E 7/8                             | 3                          | 4     | F                                  | 136                     | 67         | 59           | 20        | 02          | 00                  | 29                        |                                     | LH                  |
| R    | 0958       | E 7/8                             | 3                          | 4     | F                                  | 134                     | 67         | 59           | 23        | 04          | 00                  | 29                        |                                     | LH                  |
| R    | 1000       | E 7/8                             | 3                          | 4     | H                                  | 137                     | 64         | 50           | 00        | 00          | 00                  | 29                        | 200 16//                            | LH                  |
| R    | 1058       | E 7/8                             | 3                          | 4     | H                                  | 126                     | 67         | 59           | 24        | 06          | 00                  | 29                        | 013                                 | LH                  |
| R    | 1158       | E 7/8                             | 3                          | 4     | H                                  | 118                     | 67         | 59           | 26        | 06          | 00                  | 29                        |                                     | LH                  |
| R    | 1258       | E 7/8                             | 3                          | 4     | H                                  | 109                     | 63         | 58           | 27        | 10          | 00                  | 29                        | 727 16// 29                         | LH                  |
| R    | 1358       | E 7/8                             | 3                          | 4     | H                                  | 113                     | 65         | 57           | 22        | 04          | 00                  | 29                        |                                     | LH                  |
| R    | 1400       | E 7/8                             | 3                          | 4     | H                                  | 111                     | 64         | 57           | 24        | 04          | 00                  | 29                        |                                     | LH                  |
| R    | 1458       | E 6/8                             | 3                          | 4     | H                                  | 116                     | 64         | 57           | 25        | 05          | 00                  | 29                        | 207 16//                            | LH                  |
| R    | 1500       | E 6/8                             | 3                          | 4     | H                                  | 119                     | 64         | 57           | 24        | 05          | 00                  | 29                        |                                     | LH                  |
| R    | 1558       | E 6/8                             | 3                          | 4     | H                                  | 122                     | 63         | 59           | 00        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 1600       | E 6/8                             | 3                          | 4     | H                                  | 137                     | 63         | 59           | 23        | 03          | 00                  | 29                        | 217 1600 49                         | LH                  |
| R    | 1605       | E 6/8                             | 3                          | 4     | H                                  | 134                     | 67         | 59           | 00        | 00          | 00                  | 29                        |                                     | LH                  |
| R    | 1700       | E 6/8                             | 3                          | 4     | H                                  | 132                     | 64         | 60           | 00        | 00          | 00                  | 29                        |                                     | LH                  |

A synoptic observation, in WMO code format PUAH, is entered on line following related aviation observation.

STATION NWSED SAN CLEMENTE Island DATE 16 July 1971

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | TOL-<br>IV<br>SKY COVER | CLOUDS AND OBSCURING PHENOMENA |               |        |              |               |        |                              |             |               |        |                              |              | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |    |    |      |    |
|---------------|----------------------------------|---------------------|---------------------|-----------------------------------|-------------------------|--------------------------------|---------------|--------|--------------|---------------|--------|------------------------------|-------------|---------------|--------|------------------------------|--------------|---------------------------------|----------------------|-----------------------|----|----|------|----|
|               |                                  |                     |                     |                                   |                         | LOWEST LAYER                   |               |        | SECOND LAYER |               |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |               |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |                                 |                      |                       |    |    |      |    |
|               |                                  |                     |                     |                                   |                         | AMT                            | TYPE &<br>DIR | HEIGHT | AMT          | TYPE &<br>DIR | HEIGHT |                              | AMT         | TYPE &<br>DIR | HEIGHT |                              | AMT          | TYPE &<br>DIR                   | HEIGHT               |                       |    |    |      |    |
| 18            | 17                               | 18                  | 19                  | 20                                | 21                      | 22                             | 23            | 24     | 25           | 26            | 27     | 28                           | 29          | 30            | 31     | 32                           | 33           | 34                              | 35                   | 36                    | 37 | 38 | 39   | 40 |
| 0059          | 29.655                           | 64                  | 60                  | 81                                | 10                      | 10                             | SE            | E6     | 4            |               |        |                              | 4           |               |        |                              | 4            |                                 |                      |                       | 10 | 0  | 1010 |    |
| 0159          | 29.655                           | 62                  | 60                  | 87                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 0259          | 29.655                           | 62                  | 60                  | 87                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 0359          | 29.655                           | 62                  | 60                  | 87                                | 10                      | 10                             | ST            | ES     | 4            |               |        |                              | 4           |               |        |                              | 4            |                                 |                      |                       | 10 | 4  | 1000 |    |
| 0459          | 29.655                           | 62                  | 60                  | 87                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 0559          | 29.700                           | 62                  | 60                  | 87                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 0659          | 29.700                           | 62                  | 60                  | 87                                | 10                      | 10                             | ST            | ES     | U            |               |        |                              | U           |               |        |                              | U            |                                 |                      |                       | 10 | 1  | 1035 |    |
| 0759          | 29.705                           | 65                  | 62                  | 84                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 0859          | 29.720                           | 67                  | 63                  | 78                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 0959          | 29.730                           | 66                  | 62                  | 78                                | 10                      | 10                             | ST            | AS     | U            |               |        |                              | U           |               |        |                              | U            |                                 |                      |                       | 10 | 2  | 1030 |    |
| 1059          | 29.750                           | 67                  | 62                  | 75                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 1159          | 29.745                           | 67                  | 62                  | 75                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 1259          | 29.755                           | 69                  | 63                  | 70                                | 10                      | 10                             | SE            | E7     | 4            |               |        |                              | 4           |               |        |                              | 4            |                                 |                      |                       | 10 | 2  | 1025 |    |
| 1359          | 29.825                           | 68                  | 62                  | 73                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 1459          | 29.800                           | 67                  | 61                  | 73                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 1559          | 29.825                           | 66                  | 61                  | 75                                | 10                      | 10                             | SE            | E6     | 4            |               |        |                              | 4           |               |        |                              | 4            |                                 |                      |                       | 10 | 7  | 1020 |    |
| 1659          | 29.885                           | 65                  | 60                  | 75                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 1759          | 29.890                           | 64                  | 60                  | 78                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 1859          | 29.885                           | 64                  | 60                  | 78                                | 10                      | 10                             | SE            | E6     | 4            |               |        |                              | 4           |               |        |                              | 4            |                                 |                      |                       | 10 | 2  | 1020 |    |
| 1959          | 29.785                           | 64                  | 60                  | 78                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |
| 2059          | 29.790                           | 63                  | 60                  | 84                                | 6                       |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 6  |    |      |    |
| 2159          | 29.745                           | 63                  | 61                  | 87                                | 7                       | 7                              | SE            | E6     | 0            |               |        |                              | 7 0         |               |        |                              | 7 20         |                                 |                      |                       | 7  | 2  | 1030 |    |
| 2259          | 29.745                           | 63                  | 61                  | 87                                | 7                       |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 7  |    |      |    |
| 2359          | 29.740                           | 64                  | 61                  | 87                                | 10                      |                                |               |        |              |               |        |                              |             |               |        |                              |              |                                 |                      |                       | 10 |    |      |    |

SYNOPTIC OBSERVATIONS

| STATION PRESSURE COMPUTATIONS |            |     |             |                |                 |                |                |              |           |                 |              |   |             |    |    |    |    |                 |        |        |        |      |
|-------------------------------|------------|-----|-------------|----------------|-----------------|----------------|----------------|--------------|-----------|-----------------|--------------|---|-------------|----|----|----|----|-----------------|--------|--------|--------|------|
| TIME (GCT)                    | TIME (LST) | NO. | PRECIP (In) | SNOW FALL (In) | SNOW DEPTH (In) | MAX. TEMP (°F) | MIN. TEMP (°F) | STATE OF GND | SEA STATE | SWELL MGT. DIR. | SWELL PERIOD | SURF H <sub>1/3</sub> H <sub>1/10</sub> H <sub>1/2</sub> D <sub>1/3</sub> | WATER TEMP. |    |    |    |    |                 |        |        |        |      |
| 41                            | 42         | 43  | 44          | 45             | 46              | 47             | 48             | 49           | 50        | 51              | 52           | 53  | 54          | 55 | 56 | 57 | 58 | TIME (LST)      | 0158   | 0955   | 1555   | 2155 |
|                               | 0158       | 1   | 0           | 0              | 0               | 65             | 62             | 0            | 0         | 0               | 0            | 0   | 0           | 0  | 0  | 0  | 0  | ATT. THERM. 01  |        |        |        |      |
|                               | 0258       | 2   | 0           | 0              | 0               | 67             | 62             | 0            | 0         | 0               | 0            | 0   | 0           | 0  | 0  | 0  | 0  | OBSERVED BAR 02 | 1005.7 | 1004.8 | 1002.3 |      |
|                               | 0358       | 3   | 0           | 0              | 0               | 67             | 62             | 0            | 0         | 0               | 0            | 0   | 0           | 0  | 0  | 0  | 0  | TOTAL CORR. 03  | 0      | 0      | 0      | 0    |
|                               | 0458       | 4   | 0           | 0              | 0               | 66             | 63             | 0            | 0         | 0               | 0            | 0   | 0           | 0  | 0  | 0  | 0  | STA. PRESS. 04  | 1005.7 | 1004.8 | 1002.3 |      |
|                               | 0558       | 5   | 0           | 0              | 0               | 66             | 63             | 0            | 0         | 0               | 0            | 0   | 0           | 0  | 0  | 0  | 0  | BAROGRAPH 05    | 1005.6 | 1004.7 | 1002.2 |      |
|                               | 0658       | 6   | 0           | 0              | 0               | 64             | 63             | 0            | 0         | 0               | 0            | 0   | 0           | 0  | 0  | 0  | 0  | BAR. CORR. 06   | -0.4   | -0.5   | -0.5   | 10.1 |

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| PEAK GUSTS                      |                                 |   |  |                        |       |                            |                        |    |    |    |    |  |  | SKY COVER                          |                                   | PRECIP.<br>AND<br>THORSTM.<br>82 | BEGAN<br>83 | ENDED<br>84 | OBSTR.<br>TO<br>VISION<br>86 | BEGAN<br>87 | ENDED<br>88 |  |    |       |       |
|---------------------------------|---------------------------------|---|--|------------------------|-------|----------------------------|------------------------|----|----|----|----|--|--|------------------------------------|-----------------------------------|----------------------------------|-------------|-------------|------------------------------|-------------|-------------|--|----|-------|-------|
| 24-HR.<br>MAX.<br>TEMP.<br>(°F) | 24-HR.<br>MIN.<br>TEMP.<br>(°F) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(In.) | 24-HR.<br>SNOWFALL<br>UNMELT.<br>(In.) | SNOW<br>DEPTH<br>(In.) | SPEED | DIR.<br>REC-<br>-ION<br>29 | TIME<br>(L.S.T.)<br>73 |    |    |    |    |  |  | SUR-<br>RISE<br>TO<br>SUNSET<br>76 | WIND<br>TO<br>MID-<br>NIGHT<br>79 |                                  |             |             |                              |             |             |  |    |       |       |
|                                 |                                 |   |  |                        |       |                            |                        |    |    |    |    |  |  |                                    |                                   |                                  |             |             |                              |             |             |  |    |       |       |
| 68                              | 67                              | 68  | 69                                     | 70                     | 71    | 72                         | 73                     | 74 | 75 | 76 | 77 |  |  | 10.10                              | 10.10                             |                                  |             | 80          | 81                           |             |             |  | 14 | Count | 0430  |
| 69                              | 62                              | 0   | 0                                      | 0                      | 10    | 44                         | 1558                   |    |    |    |    |  |  |                                    |                                   |                                  |             |             |                              |             |             |  | F  | 0435  | 1350  |
|                                 |                                 |   |  |                        |       |                            |                        |    |    |    |    |  |  |                                    |                                   |                                  |             |             |                              |             |             |  | 42 | 1355  | Count |

SO. REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

FASTEST RECORDED ONE MINUTE WIND SPEED

ASSOCIATED DIRECTION

TIME

KNOTS

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

\* TUESDAY 16 JUL 1971

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

 STATION  
 NWSEA SAN CLEMENTE IS. 72

 DATE  
 17 July 1971

| Type   | Time<br>(LST) | Sky and ceiling<br>(Bunkers of Feet) | visibility<br>(Statute Miles) |               | Weather and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(Hpa.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind              |                |  | Air-<br>temp.<br>at 2m<br>(°F) | Remarks and supplemental coded data | Ob-<br>serv-<br>er's<br>initials |
|--------|---------------|--------------------------------------|-------------------------------|---------------|--|----------------------------------|---------------|--------------------|-------------------|----------------|--|--------------------------------|-------------------------------------|----------------------------------|
|        |               |                                      | Surface<br>(a)                | Tower<br>(aa) |  |                                  |               |                    | Direction<br>(°T) | Speed<br>(Kts) | Character-<br>istic and<br>shifts<br>(1) |                                |                                     |                                  |
| R 0555 | M 7 00        | 3                                    | -                             | -             | 4  | 132                              | 64            | 60                 | 06                | 01             |  | 743                            | 802 1500                            | LH                               |
| R 0655 | E 7 00        | 3                                    | -                             | -             | H  | 130                              | 64            | 59                 | 20                | 04             |  | 742                            |                                     | LH                               |
| R 0755 | E 7 00        | 3                                    | -                             | -             | H  | 132                              | 63            | 59                 | 14                | 22             |  | 742                            |                                     | LH                               |
| R 0855 | M 7 00        | 3                                    | -                             | -             | L  | 132                              | 63            | 59                 | 20                | 04             |  | 742                            | 707 1500 62                         | LH                               |
| R 0955 | E 7 00        | 3                                    | -                             | -             | L  | 130                              | 62            | 57                 | 20                | 04             |  | 743                            |                                     | LH                               |
| R 1055 | E 7 00        | 3                                    | -                             | -             | L  | 131                              | 62            | 59                 | 19                | 02             |  | 742                            |                                     | LH                               |
| R 1155 | E 7 00        | 3                                    | -                             | -             | L  | 130                              | 62            | 59                 | 22                | 05             |  | 742                            | 220 1500                            | RA                               |
| R 1255 | E 7 00        | 4                                    | -                             | -             | L  | 131                              | 62            | 59                 | 21                | 06             |  | 742                            |                                     | RA                               |
| R 1355 | E 7 00        | 5                                    | -                             | -             | L  | 134                              | 62            | 58                 | 23                | 05             |  | 742                            |                                     | RA                               |
| R 1455 | E 7 00        | 5                                    | -                             | -             | L  | 134                              | 62            | 57                 | 22                | 04             |  | 742                            | 108 1230 62                         | RA                               |
| R 1555 | E 7 00        | 5                                    | -                             | -             | L  | 134                              | 62            | 57                 | 23                | 06             |  | 742                            |                                     | RA                               |
| R 1655 | E 7 00        | 5                                    | -                             | -             | L  | 132                              | 61            | 56                 | 24                | 06             |  | 742                            |                                     | RA                               |
| R 1755 | E 7 00        | 7                                    | -                             | -             | L  | 131                              | 61            | 56                 | 24                | 08             |  | 742                            | 923 1030                            | RA                               |
| R 1855 | E 7 00        | 7                                    | -                             | -             | L  | 132                              | 61            | 56                 | 22                | 09             |  | 742                            |                                     | RA                               |
| R 1955 | E 7 00        | 7                                    | -                             | -             | L  | 134                              | 61            | 56                 | 22                | 09             |  | 742                            |                                     | RA                               |
| R 2055 | E 7 00        | 7                                    | -                             | -             | L  | 134                              | 61            | 56                 | 24                | 09             |  | 742                            | 717 1500 72                         | LH                               |
| R 2155 | E 7 00        | 7                                    | -                             | -             | L  | 134                              | 61            | 56                 | 24                | 09             |  | 742                            |                                     | LH                               |
| R 2255 | E 7 00        | 7                                    | -                             | -             | L  | 134                              | 61            | 56                 | 24                | 07             |  | 742                            |                                     | LH                               |
| R 2355 | M 12 00       | 7                                    | -                             | -             | L  | 133                              | 61            | 57                 | 30                | 06             |  | 742                            | 808 1500                            | LH                               |
| R 0055 | E 12 00       | 7                                    | -                             | -             | L  | 133                              | 61            | 57                 | 29                | 06             |  | 744                            |                                     | LH                               |
| R 0155 | E 12 00       | 7                                    | -                             | -             | L  | 137                              | 61            | 57                 | 33                | 03             |  | 747                            |                                     | LH                               |
| R 0255 | 10 00         | 7                                    | -                             | -             | L  | 147                              | 62            | 57                 | 27                | 03             |  | 747                            | 115 1500 72                         | LH                               |
| R 0355 | 10 00         | 7                                    | -                             | -             | L  | 147                              | 62            | 57                 | 20                | 06             |  | 747                            |                                     | LH                               |
| R 0455 | 10 00         | 7                                    | -                             | -             | L  | 146                              | 62            | 57                 | 20                | 04             |  | 746                            |                                     | RA                               |

A synoptic observation, in WMO code format FMI1A, is entered on line following related aviation observation.

SPRAY FORM 2(40-7 (4-65)  
6107-211-1001

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

STATION NWSEN SAN CLEMENTE Island DATE 17 July 1971

| TIME<br>(ZST) |        | STATION<br>PRESSURE<br>(IN) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMIDITY<br>(%) | TOTAL<br>SEA SURFACE | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |             |                |        |                              |              | TOTAL<br>OPAQUE<br>SKY<br>COVER | WEATHER<br>SYMBOL | NET<br>3-HR<br>CHANGE |    |    |                |        |
|---------------|--------|-----------------------------|---------------------|---------------------|-------------------------|----------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|------------------------------|--------------|---------------------------------|-------------------|-----------------------|----|----|----------------|--------|
|               |        |                             |                     |                     |                         |                      | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |                                 |                   |                       |    |    |                |        |
|               |        |                             |                     |                     |                         |                      | AMT.                           | TYPE &<br>SIG. | HEIGHT | AMT.         | TYPE &<br>SIG. | HEIGHT |                              | AMT.        | TYPE &<br>SIG. | HEIGHT |                              | AMT.         |                                 |                   |                       |    |    | TYPE &<br>SIG. | HEIGHT |
| 16            | 17     | 18                          | 19                  | 20                  | 21                      | 22                   | 23                             | 24             | 25     | 26           | 27             | 28     | 29                           | 30          | 31             | 32     | 33                           | 34           | 35                              | 36                | 37                    | 38 | 39 | 40             |        |
| 0058          | 29.740 | 64                          | 61                  | 87                  | 8                       | 8                    | Sc                             | M7             | 0      |              |                | 8      | 0                            |             |                | 8      | 0                            |              |                                 | 8                 | 8                     |    |    |                |        |
| 0158          | 29.735 | 64                          | 61                  | 84                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 8                 |                       |    |    |                |        |
| 0258          | 29.740 | 63                          | 61                  | 80                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 8                 |                       |    |    |                |        |
| 0358          | 29.720 | 62                          | 60                  | 80                  | 8                       | 8                    | Sc                             | M7             | 0      |              |                | 8      | 0                            |             |                | 8      | 0                            |              |                                 | 8                 | 7                     |    |    |                |        |
| 0458          | 29.745 | 62                          | 60                  | 87                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                | 8      |                              |              |                                 | 8                 |                       |    |    |                |        |
| 0558          | 29.745 | 63                          | 61                  | 87                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 8                 |                       |    |    |                |        |
| 0658          | 29.780 | 65                          | 61                  | 81                  | 5                       | 6                    | Sc                             | E7             | 2      | AC           | 150            | 8      | 0                            |             |                | 8      | 0                            |              |                                 | 8                 | 2                     |    |    |                |        |
| 0758          | 29.790 | 64                          | 63                  | 76                  | 5                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 9                 |                       |    |    |                |        |
| 0858          | 29.795 | 62                          | 62                  | 68                  | 7                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 7                 |                       |    |    |                |        |
| 0958          | 29.805 | 62                          | 63                  | 61                  | 7                       | 3                    | AC                             | 15             | 4      | AC           | E15            | 7      | 0                            |             |                | 7      | 0                            |              |                                 | 7                 | 1                     |    |    |                |        |
| 1058          | 29.835 | 71                          | 65                  | 61                  | 4                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 4                 |                       |    |    |                |        |
| 1158          | 29.800 | 7                           | 62                  | 61                  | 2                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 2                 |                       |    |    |                |        |
| 1258          | 29.825 | 76                          | 62                  | 57                  | 2                       | 2                    | AC                             | 150            | 0      |              |                | 2      | 0                            |             |                | 2      | 0                            |              |                                 | 2                 | 8                     |    |    |                |        |
| 1358          | 29.805 | 61                          | 62                  | 57                  | 2                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 2                 |                       |    |    |                |        |
| 1458          | 29.790 | 62                          | 62                  | 57                  | 2                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 2                 |                       |    |    |                |        |
| 1558          | 29.745 | 70                          | 62                  | 63                  | 7                       | 7                    | Sc                             | E15            | 0      |              |                | 7      | 0                            |             |                | 7      | 0                            |              |                                 | 7                 | 7                     |    |    |                |        |
| 1658          | 29.745 | 63                          | 61                  | 65                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 8                 |                       |    |    |                |        |
| 1758          | 29.745 | 66                          | 60                  | 70                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 8                 |                       |    |    |                |        |
| 1858          | 29.74  | 65                          | 60                  | 75                  | 7                       | 8                    | Sc                             | M12            | 0      |              |                | 8      | 0                            |             |                | 8      | 0                            |              |                                 | 8                 | 8                     |    |    |                |        |
| 1958          | 29.760 | 64                          | 60                  | 75                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 8                 |                       |    |    |                |        |
| 2058          | 29.785 | 64                          | 60                  | 71                  | 9                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 9                 |                       |    |    |                |        |
| 2158          | 29.785 | 65                          | 61                  | 78                  | 8                       | 8                    | Sc                             | 10             | 0      |              |                | 3      | 0                            |             |                | 3      | 0                            |              |                                 | 3                 | 1                     |    |    |                |        |
| 2258          | 29.785 | 62                          | 61                  | 84                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 2                 |                       |    |    |                |        |
| 2358          | 29.790 | 61                          | 61                  | 84                  | 8                       |                      |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 | 0                 |                       |    |    |                |        |

### SYNOPTIC OBSERVATIONS

[illegible]

**SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)**

| 24-HR.<br>MAX.<br>TEMP.<br>(°F) | 24-HR.<br>MIN.<br>TEMP.<br>(°F) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(Inch.) | 24-HR.<br>INCHES OF ALL<br>FALL<br>WIND<br>(Inch.) | SNOW<br>DEPTH<br>(Inch.) | PEAK GUSTS  |                           |                        | 74 | 75 | 76 | 77 | SKY COVER                          |                                    | 80 | 81 | AND<br>THUNDERST.<br>82 | BEGAN<br>83 | ENDED<br>84 | TO<br>VISION<br>85 | BEGAN<br>87 | ENDED<br>88 |
|---------------------------------|---------------------------------|---|--|--------------------------|-------------|---------------------------|------------------------|----|----|----|----|------------------------------------|------------------------------------|----|----|-------------------------|-------------|-------------|--------------------|-------------|-------------|
|                                 |                                 |   |  |                          | SPEED<br>71 | DI-<br>REC-<br>TION<br>72 | TIME<br>(L.O.T.)<br>73 |    |    |    |    | SUN-<br>SHINE<br>PER<br>CENT<br>78 | WID-<br>TH-<br>RIGHT<br>WIND<br>79 |    |    |                         |             |             |                    |             |             |
|                                 |                                 |   |  |                          |             |                           |                        |    |    |    |    |                                    |                                    |    |    |                         |             |             |                    |             |             |
| 66                              | 62                              | 68  | 69   | 70                       |             |                           |                        |    |    |    |    |                                    |                                    |    |    |                         |             |             |                    |             |             |
| 72                              | 63                              | 6   | 6  | 6                        | 6           | 6                         | 1555                   |    |    |    |    | 70                                 | 70                                 |    |    |                         |             |             | 1                  | 1250        |             |

7/21/51 4:00 PM 02 410-11 1100 1100

**KNOTS**

**NOTE:** There are no required entries in columns without headings.  
 \*Any data needed locally may be entered\*.

\* DIVER 11 - 11/11/11 SE - 2458 - SS 1904

OPNAV FORM 3100-6 (REV. 6-61)

NAO FORM 100

 DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

STATION

UNCLD SAN CLEMENTE IS.

DATE

18 JULY 1971

| Type | Time (LST) | Sky and ceiling (Hundreds of feet) | visibility (Statute Miles) |            | Weather and obstructions to vision | Sea level press. (Hb.) | Temp. (°F) | Dew pt. (°F) | Wind          |           |                           | Air temp. (°F) | Remarks and supplemental coded data |  |    |
|------|------------|------------------------------------|----------------------------|------------|------------------------------------|------------------------|------------|--------------|---------------|-----------|---------------------------|----------------|-------------------------------------|--|----|
|      |            |                                    | Surface (a)                | Tower (aa) |                                    |                        |            |              | Direction (b) | Speed (c) | Character and shifts (cc) |                |                                     |  |    |
| R    | 0058       | 0                                  | 7                          |            |                                    | 142                    | 62         | 58           | 21            | 03        |                           | 205            | 805                                 |  | NA |
| R    | 0158       | 100                                | 7                          |            |                                    | 139                    | 62         | 59           | 00            | 00        |                           | 214            |                                     |  | NA |
| R    | 0258       | 100                                | 7                          |            |                                    | 138                    | 62         | 58           | 10            | 20        |                           | 210            |                                     |  | NA |
| R    | 0358       | 7                                  | 5                          |            | U                                  | 139                    | 63         | 59           | 30            | 00        |                           | 220            | 707 60                              |  | NA |
| R    | 0458       | 0                                  | 5                          |            | U                                  | 142                    | 60         | 58           | 26            | 02        |                           | 205            |                                     |  | NA |
| R    | 0558       | 100                                | 5                          |            | H                                  | 143                    | 61         | 59           | 26            | 04        |                           | 206            |                                     |  | NA |
| R    | 0658       | 100                                | 7                          |            |                                    | 147                    | 62         | 60           | 20            | 00        |                           | 207            | 203 1500                            |  | NA |
| R    | 0758       | E 100                              | 7                          |            |                                    | 147                    | 62         | 59           | 22            | 02        |                           | 207            |                                     |  | NA |
| R    | 0858       | E 100                              | 7                          |            |                                    | 146                    | 70         | 58           | 28            | 06        |                           | 206            |                                     |  | NA |
| R    | 0958       | B 100                              | 7                          |            |                                    | 147                    | 70         | 57           | 27            | 07        |                           | 207            | 500 1500 60                         |  | NA |
| R    | 1058       | E 100                              | 7                          |            |                                    | 146                    | 71         | 56           | 27            | 05        |                           | 206            |                                     |  | NA |
| R    | 1158       | 100                                | 7                          |            |                                    | 143                    | 71         | 56           | 27            | 08        |                           | 206            |                                     |  | NA |
| R    | 1258       | 100                                | 7                          |            |                                    | 138                    | 71         | 56           | 27            | 07        |                           | 204            | 708 1500                            |  | NA |
| R    | 1358       | 100                                | 7                          |            |                                    | 136                    | 71         | 57           | 27            | 11        |                           | 203            |                                     |  | NA |
| R    | 1458       | E 100                              | 7                          |            |                                    | 130                    | 71         | 57           | 25            | 08        |                           | 202            |                                     |  | NA |
| R    | 1558       | E 100                              | 7                          |            |                                    | 126                    | 70         | 59           | 26            | 09        |                           | 203            | 712 1500 71                         |  | NA |
| R    | 1658       | E 100                              | 10                         |            |                                    | 124                    | 69         | 59           | 26            | 10        |                           | 200            |                                     |  | NA |
| R    | 1758       | E 100                              | 10                         |            |                                    | 124                    | 65         | 57           | 26            | 10        |                           | 200            |                                     |  | NA |
| R    | 1858       | E 100                              | 10                         |            |                                    | 121                    | 63         | 57           | 27            | 08        |                           | 200            | 705 1511                            |  | NA |
| R    | 1958       | E 100                              | 5                          |            | H                                  | 132                    | 63         | 59           | 25            | 06        |                           | 202            |                                     |  | NA |
| R    | 2058       | E 50                               | 5                          |            | U                                  | 142                    | 63         | 58           | 24            | 05        |                           | 205            |                                     |  | NA |
| R    | 2158       | E 50                               | 5                          |            | H                                  | 142                    | 62         | 58           | 22            | 07        |                           | 205            | 120 1611 71                         |  | NA |
| R    | 2258       | E 50                               | 5                          |            | H                                  | 138                    | 61         | 58           | 22            | 08        |                           | 204            |                                     |  | NA |
| R    | 2358       | E 50                               | 5                          |            | H                                  | 132                    | 61         | 58           | 22            | 05        |                           | 203            |                                     |  | NA |

A synoptic observation, U. S. MNO code format 7411A, is entered on line following related aviation observation.

OP 0057

STATION ANSWERED SON CLEMENTE IS.

DATE 18 JULY 1971

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL<br>HU-<br>MID-<br>ITY<br>(%) | TOTAL<br>SKY COVER | CLOUDS AND OBSCURING PHENOMENA |               |        |              |                |        |                              |             |                |        | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |    |    |                              |              |               |        |
|---------------|----------------------------------|---------------------|---------------------|----------------------------------|--------------------|--------------------------------|---------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|---------------------------------|----------------------|-----------------------|----|----|------------------------------|--------------|---------------|--------|
|               |                                  |                     |                     |                                  |                    | LOWEST LAYER                   |               |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        |                                 |                      |                       |    |    | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |               |        |
|               |                                  |                     |                     |                                  |                    | AMT.                           | TYPE &<br>DIR | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |                              | AMT.        | TYPE &<br>DIR. | HEIGHT |                                 |                      |                       |    |    |                              | AMT.         | TYPE &<br>DIR | HEIGHT |
| 16            | 17                               | 18                  | 19                  | 20                               | 21                 | 22                             | 23            | 24     | 25           | 26             | 27     | 28                           | 29          | 30             | 31     | 32                              | 33                   | 34                    | 35 | 36 | 37                           | 38           | 39            | 40     |
| 0050          | 29.700                           | 62                  | 60                  | 87                               | 0                  | 0                              |               |        | 0            |                |        | 0                            | 0           |                |        | 0                               | 0                    |                       |    | 0  | 3                            |              |               |        |
| 0150          | 29.720                           | 62                  | 60                  | 87                               | 2                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 2  |                              |              |               |        |
| 0250          | 29.720                           | 62                  | 60                  | 87                               | 1                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 1  |                              |              |               |        |
| 0350          | 29.720                           | 61                  | 59                  | 93                               | 0                  | 0                              |               |        | 0            |                |        | 0                            | 0           |                |        | 0                               | 0                    |                       |    | 0  | 1                            |              |               |        |
| 0450          | 29.720                           | 60                  | 59                  | 93                               | 0                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 0  |                              |              |               |        |
| 0550          | 29.720                           | 61                  | 59                  | 91                               | 1                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 1  |                              |              |               |        |
| 0650          | 29.725                           | 63                  | 63                  | 75                               | R                  | 2                              | Sc            | 10     | 0            |                |        | 2                            | 0           |                |        | 2                               | 0                    |                       |    | 2  | 2                            |              |               |        |
| 0750          | 29.725                           | 62                  | 63                  | 70                               | 6                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 6  |                              |              |               |        |
| 0850          | 29.725                           | 70                  | 62                  | 66                               | 7                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 7  |                              |              |               |        |
| 0950          | 29.735                           | 70                  | 62                  | 63                               | 8                  | 8                              | Sc            | B10    | 0            |                |        | 8                            | 0           |                |        | 8                               | 0                    |                       |    | 8  | 5                            |              |               |        |
| 1050          | 29.780                           | 70                  | 61                  | 61                               | 8                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 8  |                              |              |               |        |
| 1150          | 29.775                           | 71                  | 62                  | 59                               | 5                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 5  |                              |              |               |        |
| 1250          | 29.770                           | 71                  | 62                  | 59                               | 4                  | 4                              | Sc            | 10     | 0            |                |        | 4                            | 0           |                |        | 4                               | 0                    |                       |    | 4  | 7                            |              |               |        |
| 1350          | 29.750                           | 71                  | 62                  | 61                               | 5                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 5  |                              |              |               |        |
| 1450          | 29.735                           | 71                  | 62                  | 61                               | 6                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 6  |                              |              |               |        |
| 1550          | 29.720                           | 70                  | 61                  | 61                               | 8                  | 8                              | Sc            | F10    | 0            |                |        | 8                            | 0           |                |        | 8                               | 0                    |                       |    | 8  | 7                            |              |               |        |
| 1650          | 29.720                           | 69                  | 61                  | 65                               | 7                  |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 7  |                              |              |               |        |
| 1750          | 29.720                           | 65                  | 60                  | 75                               | 10                 |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |               |        |
| 1850          | 29.720                           | 63                  | 59                  | 81                               | 10                 | 10                             | Sc            | F10    | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 7                            |              |               |        |
| 1950          | 29.720                           | 63                  | 60                  | 84                               | 10                 |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |               |        |
| 2050          | 29.720                           | 63                  | 60                  | 84                               | 10                 |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |               |        |
| 2150          | 29.720                           | 62                  | 60                  | 84                               | 10                 | 10                             | Sc            | F5     | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 1                            |              |               |        |
| 2250          | 29.720                           | 61                  | 59                  | 90                               | 10                 |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |               |        |
| 2350          | 29.740                           | 61                  | 59                  | 90                               | 10                 |                                |               |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |               |        |

## SYNOPTIC OBSERVATIONS

|               |               |     |                 |                      |                       |                       |                       |    |                      |                           |                       |                 |  |                |    |    |    | STATION PRESSURE COMPUTATIONS |             |       |       |
|---------------|---------------|-----|-----------------|----------------------|-----------------------|-----------------------|-----------------------|----|----------------------|---------------------------|-----------------------|-----------------|--|----------------|----|----|----|-------------------------------|-------------|-------|-------|
| TIME<br>(GCT) | TIME<br>(LST) | NO. | PRECIP.<br>(In) | SNOW<br>FALL<br>(In) | SNOW<br>DEPTH<br>(In) | MAX.<br>TEMP.<br>(°F) | MIN.<br>TEMP.<br>(°F) |    | STATE<br>OF<br>CLOUD | SEA<br>STATE<br>&<br>DIR. | SWELL<br>HGT.<br>DIR. | SWELL<br>PERIOD | SURF<br>H <sub>2</sub> H <sub>2</sub><br>H <sub>2</sub> P H <sub>2</sub> S | WATER<br>TEMP. |    |    |    | TIME (LST)                    |             |       |       |
| 41            | 42            | 43  | 44              | 45                   | 46                    | 47                    | 48                    | 49 | 50                   | 51                        | 52                    | 53              | 54   | 55             | 56 | 57 | 58 | 59                            |             |       |       |
|               | MID TO        | X   | 0               | 0                    | X                     | 62                    | 60                    | X  | X                    | X                         | X                     | X               | X  | X              | X  |    |    |                               | 0955        | 1055  | 2155  |
|               |               |     |                 |                      |                       |                       |                       |    |                      |                           |                       |                 |  |                |    |    |    |                               | ATT. THERM. |       |       |
|               | 0752          | 1   | 0               | 0                    | 0                     | 63                    | 60                    |    | 0                    |                           |                       |                 |  |                |    |    |    |                               | DEPTHS, BAR | 100.0 | 100.0 |
|               | 0952          | 2   | 0               | 0                    | 0                     | 70                    | 60                    |    | 0                    |                           |                       |                 |  |                |    |    |    |                               | TOTAL CORR. | 0     | 0     |
|               | 1552          | 3   | 0               | 0                    | 0                     | 71                    | 70                    |    | 0                    |                           |                       |                 |  |                |    |    |    |                               | STA. PRESS. | 100.0 | 100.0 |
|               | 2152          | 4   | 0               | 0                    | 0                     | 70                    | 62                    |    | 0                    |                           |                       |                 |  |                |    |    |    |                               | BAROGRAPH   | 100.0 | 100.0 |
|               | MID           | X   | 0               | 0                    | 0                     | 62                    | 61                    | X  | X                    | X                         | X                     | X               | X  | X              | X  |    |    |                               | BAR. CORR.  | 0.0   | 0.0   |

**SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)**

| STATION: (LATITUDE) (LONGITUDE) |                                 |   |   |                          |            |                      |                  |                                    |  |                       |             |             |                    |             |             |  |
|---------------------------------|---------------------------------|---|---|--------------------------|------------|----------------------|------------------|------------------------------------|--|-----------------------|-------------|-------------|--------------------|-------------|-------------|--|
| 24-HR.<br>MAX.<br>TEMP.<br>(°F) | 24-HR.<br>MIN.<br>TEMP.<br>(°F) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(Inch.) | 24-HR.<br>SNOWFALL<br>UNGLD.<br>(Inch.) | SNOW<br>DEPTH<br>(Inch.) | PEAK GUSTS |                      |                  | SKY COVER                          |  | AND<br>THORSTM.<br>82 | BEGAN<br>83 | ENDED<br>84 | TO<br>VISION<br>85 | BEGAN<br>87 | ENDED<br>88 |  |
|                                 |                                 |   |   |                          | SPEED      | DIR.<br>REC.<br>DIR. | TIME<br>(L.S.T.) | 81-<br>RISE-<br>TO<br>SUNSET<br>79 | 80-<br>RIGHT<br>-<br>MID-<br>NIGHT<br>78 |                       |             |             |                    |             |             |  |
| 66                              | 67                              | 50  | 00                                      | 70                       | 71         | 72                   | 73               | 74                                 | 75                                       | 76                    | 77          |             |                    |             |             |  |
| 71                              | 60                              | 0   | 0                                       | 70                       | 11         | W                    | 135?             |                                    |  |                       |             |             | 14                 | 1200        | CONT        |  |

90. REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

**FASTEST RECOVERED ONE MINUTE WIND SPEED**

**ASSOCIATED DIRECTOR**

**NOTE**

## KNOTS

**NOTE:** There are no required entries in columns without headings.  
"Any data needed locally may be entered".

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

 STATION  
 NWSE0 SAN CLEMENTE IS.  
 DATE  
 19 July 1971

| Type | Time<br>(ZST) | Sky and ceiling<br>(Hundreds of Feet) | Visibility<br>(Statute Miles) |              | Weather<br>and<br>observations<br>to vision | Sea<br>level<br>press.<br>(Hgs.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind             |                       |   | Air-<br>sea<br>temp<br>diff.<br>(°F) | Remarks and supplemental coded data | Air-<br>sea<br>temp<br>diff.<br>(°F) |
|------|---------------|---------------------------------------|-------------------------------|--------------|---|----------------------------------|---------------|--------------------|------------------|-----------------------|---|--------------------------------------|-------------------------------------|--------------------------------------|
|      |               |                                       | Surface<br>(1)                | Temp.<br>(2) |   |                                  |               |                    | Direction<br>(3) | Speed<br>(Kts)<br>(4) | Character-<br>istic and<br>quality<br>(5) |                                      |                                     |                                      |
| R    | 0058          | 1150                                  | 5                             |              | H   | 125                              | 62            | 57                 | 22               | 06                    |   | 991                                  | 714 1511                            | 24                                   |
| R    | 0158          | 1150                                  | 5                             |              | H   | 124                              | 62            | 57                 | 24               | 04                    |   | 990                                  |                                     | 24                                   |
| R    | 0258          | 1150                                  | 5                             |              | H   | 123                              | 62            | 57                 | 26               | 02                    |   | 990                                  |                                     | 24                                   |
| R    | 0358          | 1150                                  | 5                             |              | H   | 122                              | 62            | 57                 | 24               | 00                    |   | 990                                  | 605 1511 60                         | 24                                   |
| R    | 0458          | 1150                                  | 5                             |              | F   | 126                              | 61            | 59                 | 27               | 05                    |   | 991                                  |                                     | 24                                   |
| R    | 0558          | 1150                                  | 5                             |              | F   | 122                              | 60            | 60                 | 20               | 10                    |   | 990                                  |                                     | 24                                   |
| R    | 0658          | 1150                                  | 5                             |              | F   | 122                              | 60            | 60                 | 20               | 10                    |   | 990                                  |                                     | 24                                   |
| R    | 0758          | 1150                                  | 5                             |              | F   | 122                              | 60            | 60                 | 20               | 10                    |   | 990                                  |                                     | 24                                   |
| R    | 0858          | 1150                                  | 5                             |              | F   | 122                              | 60            | 60                 | 20               | 10                    |   | 990                                  |                                     | 24                                   |
| R    | 0958          | 1150                                  | 5                             |              | F   | 122                              | 60            | 60                 | 20               | 10                    |   | 990                                  |                                     | 24                                   |
| R    | 1058          | 1150                                  | 5                             |              | F   | 122                              | 60            | 60                 | 20               | 10                    |   | 990                                  |                                     | 24                                   |
| R    | 1158          | 1150                                  | 5                             |              | H   | 127                              | 64            | 59                 | 27               | 06                    |   | 990                                  | 110 1611 60                         | 24                                   |
| R    | 1258          | 1150                                  | 5                             |              | H   | 147                              | 66            | 58                 | 27               | 08                    |   | 997                                  | 111                                 | 24                                   |
| R    | 1358          | 1150                                  | 5                             |              | H   | 147                              | 67            | 57                 | 25               | 09                    |   | 997                                  |                                     | 24                                   |
| R    | 1458          | 1150                                  | 5                             |              | H   | 132                              | 67            | 58                 | 25               | 10                    |   | 997                                  | 108 1611                            | 24                                   |
| R    | 1558          | 1150                                  | 5                             |              | H   | 134                              | 67            | 58                 | 27               | 12                    |   | 997                                  | 113                                 | 24                                   |
| R    | 1658          | 1150                                  | 5                             |              | H   | 134                              | 67            | 58                 | 29               | 10                    |   | 997                                  |                                     | 24                                   |
| R    | 1758          | 1150                                  | 5                             |              | H   | 126                              | 65            | 56                 | 26               | 10                    |   | 991                                  | 712 1611 67                         | 24                                   |
| R    | 1858          | 1150                                  | 5                             |              | H   | 121                              | 65            | 57                 | 27               | 10                    |   | 990                                  | BINOUC                              | 24                                   |
| R    | 1958          | 1150                                  | 5                             |              | H   | 123                              | 64            | 57                 | 27               | 09                    |   | 990                                  | BINOUC                              | 24                                   |
| R    | 2058          | 1150                                  | 5                             |              | H   | 124                              | 62            | 58                 | 27               | 09                    |   | 990                                  | BINOUC 502 1611                     | 24                                   |
| R    | 2158          | 1150                                  | 5                             |              | H   | 126                              | 62            | 58                 | 25               | 06                    |   | 991                                  |                                     | 24                                   |
| R    | 2258          | 1150                                  | 5                             |              | H   | 136                              | 62            | 58                 | 25               | 06                    |   | 993                                  |                                     | 24                                   |
| R    | 2358          | 1150                                  | 5                             |              | H   | 136                              | 61            | 58                 | 24               | 07                    |   | 994                                  | 110 1600 67                         | 24                                   |
| R    | 0058          | 1150                                  | 5                             |              | H   | 137                              | 61            | 58                 | 25               | 05                    |   | 994                                  |                                     | 24                                   |
| R    | 0158          | 1150                                  | 5                             |              | H   | 132                              | 61            | 58                 | 24               | 08                    |   | 992                                  |                                     | 24                                   |

A synoptic observation, in WMO code format PW14, is entered on line following related aviation observation.

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

VRAN 100

77

STATION NWSED SAN CLEMENTE Island DATE 19 July 1971

| STATION    |                    | 20 JUAN VICENTE ISLAND |               |                    |                 |                                  |             |        |              |             |        | DATE            |             | 14 July 1971 |              |     |             |                        |                   |                 |    |    |        |    |  |
|------------|--------------------|------------------------|---------------|--------------------|-----------------|----------------------------------|-------------|--------|--------------|-------------|--------|-----------------|-------------|--------------|--------------|-----|-------------|------------------------|-------------------|-----------------|----|----|--------|----|--|
| TIME (LST) | STATION PRES. (In) | DRY BULB (°F)          | WET BULB (°F) | REL. HUM. MID. (%) | TOTAL SKY COVER | CLOUDS AND OBSERVATION PHENOMENA |             |        |              |             |        |                 |             |              |              |     |             | TOTAL OPAQUE SKY COVER | PRESSURE TENDENCY | NET 3-HR CHANGE |    |    |        |    |  |
|            |                    |                        |               |                    |                 | LOWEST LAYER                     |             |        | SECOND LAYER |             |        | SUMMATION TOTAL | THIRD LAYER |              | FOURTH LAYER |     |             |                        |                   |                 |    |    |        |    |  |
|            |                    |                        |               |                    |                 | AMT                              | TYPE & DIR. | HEIGHT | AMT          | TYPE & DIR. | HEIGHT |                 | AMT         | TYPE & DIR.  | HEIGHT       | AMT | TYPE & DIR. |                        |                   |                 |    |    | HEIGHT |    |  |
| 18         | 17                 | 18                     | 19            | 20                 | 21              | 22                               | 23          | 24     | 25           | 26          | 27     | 28              | 29          | 30           | 31           | 32  | 33          | 34                     | 35                | 36              | 37 | 38 | 39     | 40 |  |
| 0058       | 29.730             | 60                     | 59            | 73                 | 10              | 10                               | Sc M5       | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 | 7  | .040   |    |  |
| 0158       | 29.725             | 60                     | 59            | 73                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 0258       | 29.715             | 60                     | 59            | 93                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 0358       | 29.715             | 60                     | 59            | 73                 | 10              | 10                               | Sc M13      | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 | 6  | .015   |    |  |
| 0458       | 29.725             | 61                     | 60            | 93                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 0558       | 29.740             | 60                     | 60            | 100                | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 0658       | 29.755             | 60                     | 60            | 100                | 10              | 10                               | F W3        | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 |    |        |    |  |
| 0758       | 29.770             | 62                     | 61            | 93                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 | 2  | .040   |    |  |
| 0858       | 29.785             | 62                     | 61            | 93                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 0958       | 29.735             | 64                     | 61            | 84                 | 10              | 10                               | Sc 33       | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 |    |        |    |  |
| 1058       | 29.785             | 66                     | 61            | 75                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 | 1  | .030   |    |  |
| 1158       | 29.775             | 67                     | 61            | 70                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 1258       | 29.760             | 67                     | 60            | 68                 | 10              | 10                               | Sc E7       | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 |    |        |    |  |
| 1358       | 29.740             | 67                     | 60            | 68                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 | 8  | .025   |    |  |
| 1458       | 29.745             | 67                     | 60            | 68                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 1558       | 29.725             | 65                     | 60            | 73                 | 10              | 10                               | Sc E7       | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 |    |        |    |  |
| 1658       | 29.720             | 65                     | 60            | 75                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 | 7  | .035   |    |  |
| 1758       | 29.715             | 64                     | 60            | 78                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |
| 1858       | 29.720             | 62                     | 60            | 84                 | 10              | 10                               | Sc E7       | U      |              |             |        |                 | U           |              |              |     | U           |                        |                   |                 | 10 |    |        |    |  |
| 1958       | 29.725             | 62                     | 60            | 84                 | 8               |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 | 5  | .005   |    |  |
| 2058       | 29.750             | 62                     | 60            | 84                 | 8               |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 8  |    |        |    |  |
| 2158       | 29.750             | 61                     | 59            | 90                 | 8               | 8                                | Sc E6       | 0      |              |             |        |                 | 8           | 0            |              |     | 8           | 0                      |                   |                 | 8  |    |        |    |  |
| 2258       | 29.755             | 61                     | 59            | 90                 | 8               |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 8  | 1  | .030   |    |  |
| 2358       | 29.760             | 61                     | 59            | 90                 | 10              |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 8  |    |        |    |  |
|            |                    |                        |               |                    |                 |                                  |             |        |              |             |        |                 |             |              |              |     |             |                        |                   |                 | 10 |    |        |    |  |

SYNOPTIC OBSERVATIONS

| TIME (GMT) | TIME (LST) | NO. | PRECIP. (In) | SNOW FALL (In) | SNOW DEPTH (In) | MAX. TEMP. (°F) | MIN. TEMP. (°F) | STATE OF SKY | SEA STATE | SWELL HGT. & DIR. | SWELL PERIOD | SURF. WAVE HGT. & DIR. | WATER TEMP. | STATION PRESSURE COMPUTATIONS |    |    |    |    |    |    |    |    |    |
|------------|------------|-----|--------------|----------------|-----------------|-----------------|-----------------|--------------|-----------|-------------------|--------------|------------------------|-------------|-------------------------------|----|----|----|----|----|----|----|----|----|
| 01         | 02         | 03  | 04           | 05             | 06              | 07              | 08              | 09           | 10        | 11                | 12           | 13                     | 14          | 15                            | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|            | MID        |     | 0            | 0              | 0               | 61              | 50              | 0            | 0         | 0                 | 0            | 0                      | 0           | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 0352       | 1          | 0   | 0            | 0              | 0               | 60              | 50              | 0            | 0         | 0                 | 0            | 0                      | 0           | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 0452       | 2          | 0   | 0            | 0              | 0               | 64              | 50              | 0            | 0         | 0                 | 0            | 0                      | 0           | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 1552       | 3          | 0   | 0            | 0              | 0               | 67              | 64              | 0            | 0         | 0                 | 0            | 0                      | 0           | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| 2152       | 4          | 0   | 0            | 0              | 0               | 65              | 61              | 0            | 0         | 0                 | 0            | 0                      | 0           | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|            | MID        |     | 0            | 0              | 0               | 61              | 61              | 0            | 0         | 0                 | 0            | 0                      | 0           | 0                             | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  |

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| 24-HR. MAX. TEMP. (°F) | 24-HR. MIN. TEMP. (°F) | 24-HR. PRECIP. (In) | 24-HR. SNOWFALL (In) | 24-HR. SNOW DEPTH (In) | PEAK GUSTS | SKY COVER | PRECIP. AND THORSTN. | BEGAN | ENDED | OBSTR. TO VISION | BEGAN | ENDED |
|------------------------|------------------------|---------------------|----------------------|------------------------|------------|-----------|----------------------|-------|-------|------------------|-------|-------|
| 66                     | 67                     | 0                   | 0                    | 0                      | 17         | 10        | 0                    |       |       | H                | 0430  | 0715  |
| 67                     | 60                     | 0                   | 0                    | 0                      | 17         | 10        | 0                    |       |       | F                | 0915  | 1230  |

REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

| FASTEST RECORDED ONE MINUTE WIND SPEED | ASSOCIATED DIRECTION | TIME |
|--|----------------------|------|
| KNOTS                                  |                      |      |

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

\* TOWER NOT PLANNED

F+

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

STATION

NWAFD 90W CEMENTS IS.

DATE

20 JULY 1971

| Type | Time<br>(LST) | Sky and ceiling<br>(Hundreds of feet) | visibility<br>(Statute Miles) |               | weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(Hpa.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind<br>dir<br>(°T) | Wind<br>speed<br>(Kts) | Character<br>and<br>dir<br>(°T) | Air<br>temp.<br>(°F) | Remarks and supplemental coded data | Observer's<br>initials |
|------|---------------|---------------------------------------|-------------------------------|---------------|---|----------------------------------|---------------|--------------------|---------------------|------------------------|---------------------------------|----------------------|-------------------------------------|------------------------|
|      |               |                                       | Surface<br>(a)                | Upper<br>(aa) |   |                                  |               |                    |                     |                        |                                 |                      |                                     |                        |
| R    | 0552          | E 2 5                                 | 5                             |               | H   | 122                              | 61            | 57                 | 28                  | 107                    |                                 | 991                  | 5 27 16//                           | RS                     |
| R    | 0602          | E 2 1                                 | 5                             |               | H   | 122                              | 61            | 57                 | 28                  | 107                    |                                 | 991                  |                                     | RS                     |
| R    | 0658          | E 4 2                                 | 5                             |               | H   | 124                              | 60            | 57                 | 28                  | 107                    |                                 | 990                  |                                     | RS                     |
| R    | 0703          | E 5 5                                 | 5                             |               | H   | 125                              | 60            | 57                 | 27                  | 107                    |                                 | 990                  | 5 27 16// 20                        | RS                     |
| R    | 0715          | E 5 5                                 | 5                             |               | H   | 124                              | 60            | 56                 | 28                  | 108                    |                                 | 990                  |                                     | RS                     |
| R    | 0753          | E 7 3                                 | 5                             |               | H   | 125                              | 60            | 57                 | 27                  | 107                    |                                 | 990                  |                                     | RS                     |
| R    | 0858          | B 7 3                                 | 5                             |               | H   | 137                              | 61            | 57                 | 28                  | 104                    |                                 | 994                  | 308 16//                            | RS                     |
| R    | 0958          | A 8 3                                 | 6                             |               | H   | 137                              | 62            | 57                 | 27                  | 106                    |                                 | 994                  | 314                                 | RS                     |
| R    | 1053          | E 8 3                                 | 6                             |               | H   | 137                              | 64            | 57                 | 30                  | 105                    |                                 | 994                  |                                     | RS                     |
| R    | 1152          | E 8 3                                 | 7                             |               |   | 137                              | 65            | 58                 | 27                  | 109                    |                                 | 991                  | 400 16// 60                         | RS                     |
| R    | 1252          | E 8 3                                 | 7                             |               |   | 137                              | 66            | 58                 | 27                  | 109                    |                                 | 991                  |                                     | RS                     |
| R    | 1352          | E 8 3                                 | 7                             |               |   | 134                              | 66            | 57                 | 26                  | 109                    |                                 | 992                  |                                     | RS                     |
| R    | 1452          | E 8 3                                 | 7                             |               |   | 132                              | 67            | 57                 | 27                  | 111                    |                                 | 992                  | 205 16//                            | RS                     |
| R    | 1552          | A 8 3                                 | 7                             |               |   | 126                              | 67            | 57                 | 27                  | 110                    |                                 | 991                  | 315                                 | RS                     |
| R    | 1652          | E 8 3                                 | 7                             |               |   | 121                              | 67            | 57                 | 27                  | 108                    |                                 | 989                  |                                     | RS                     |
| R    | 1752          | A 7 3                                 | 7                             |               |   | 114                              | 66            | 58                 | 27                  | 108                    |                                 | 987                  | 717 16// 67                         | RS                     |
| R    | 1852          | E 7 3                                 | 7                             |               |   | 111                              | 64            | 57                 | 28                  | 108                    |                                 | 986                  |                                     | RS                     |
| R    | 1952          | E 7 3                                 | 7                             |               |   | 111                              | 62            | 57                 | 29                  | 107                    |                                 | 986                  |                                     | RS                     |
| R    | 2052          | B 6 3                                 | 7                             |               |   | 118                              | 62            | 57                 | 29                  | 106                    |                                 | 988                  | 303 16//                            | RS                     |
| R    | 2152          | E 6 3                                 | 7                             |               |   | 121                              | 62            | 57                 | 29                  | 106                    |                                 | 989                  |                                     | RS                     |
| R    | 2252          | E 6 3                                 | 7                             |               |   | 124                              | 61            | 57                 | 29                  | 107                    |                                 | 990                  |                                     | RS                     |
| R    | 2352          | M 5 3                                 | 7                             |               |   | 124                              | 61            | 57                 | 28                  | 107                    |                                 | 990                  | 107 16// 67                         | RS                     |
| R    | 0052          | E 5 3                                 | 7                             |               |   | 124                              | 61            | 58                 | 29                  | 106                    |                                 | 990                  |                                     | RS                     |
| R    | 0152          | E 6 3                                 | 7                             |               |   | 124                              | 61            | 58                 | 27                  | 105                    |                                 | 990                  |                                     | RS                     |

A synoptic observation, in WMO code format FILLIA, is entered on line following related aviation observation.

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

79  
TBAN 10B

STATION ANSEN SDN CLMONT IS

DATE 20 JULY 1971

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL<br>HU-<br>MID-<br>ITY<br>(%) | TOTAL<br>CLOUD<br>AMOUNT | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |             |                |        |                              |              | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |    |      |    |    |
|---------------|----------------------------------|---------------------|---------------------|----------------------------------|--------------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|------------------------------|--------------|---------------------------------|----------------------|-----------------------|----|------|----|----|
|               |                                  |                     |                     |                                  |                          | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |                                 |                      |                       |    |      |    |    |
|               |                                  |                     |                     |                                  |                          | AMT                            | TYPE &<br>DIR. | HEIGHT | AMT          | TYPE &<br>DIR. | HEIGHT |                              | AMT         | TYPE &<br>DIR. | HEIGHT |                              | AMT          | TYPE &<br>DIR.                  | HEIGHT               |                       |    |      |    |    |
| 16            | 17                               | 18                  | 19                  | 20                               | 21                       | 22                             | 23             | 24     | 25           | 26             | 27     | 28                           | 29          | 30             | 31     | 32                           | 33           | 34                              | 35                   | 36                    | 37 | 38   | 39 | 40 |
| 00:30         | 29.720                           | 61                  | 59                  | 87                               | 10                       | 10                             | 50             | E6     | 4            |                |        |                              | 4           |                |        |                              | 4            |                                 |                      | 10                    | 8  | .020 |    |    |
| 01:30         | 29.720                           | 60                  | 58                  | 90                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 02:30         | 29.721                           | 60                  | 58                  | 91                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 03:30         | 29.730                           | 60                  | 58                  | 90                               | 10                       | 10                             | 50             | E6     | 4            |                |        |                              | 4           |                |        |                              | 4            |                                 |                      | 10                    | 5  | .020 |    |    |
| 04:30         | 29.720                           | 60                  | 58                  | 90                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 05:30         | 29.735                           | 60                  | 58                  | 90                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 06:30         | 29.755                           | 61                  | 59                  | 87                               | 10                       | 10                             | 50             | B7     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 3  | .025 |    |    |
| 07:30         | 29.755                           | 62                  | 59                  | 84                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 08:30         | 29.755                           | 64                  | 60                  | 78                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 09:30         | 29.755                           | 65                  | 61                  | 78                               | 10                       | 10                             | 50             | E8     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 4  | .000 |    |    |
| 10:30         | 29.755                           | 66                  | 61                  | 75                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 11:30         | 29.745                           | 66                  | 60                  | 73                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 12:30         | 29.740                           | 67                  | 61                  | 70                               | 10                       | 10                             | 50             | E8     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 8  | .015 |    |    |
| 13:30         | 29.725                           | 67                  | 61                  | 70                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 14:30         | 29.710                           | 66                  | 60                  | 73                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 15:30         | 29.690                           | 66                  | 61                  | 75                               | 10                       | 10                             | 50             | A7     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 7  | .050 |    |    |
| 16:30         | 29.680                           | 64                  | 60                  | 78                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 17:30         | 29.680                           | 62                  | 59                  | 84                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 18:30         | 29.700                           | 62                  | 59                  | 84                               | 10                       | 10                             | 50             | B6     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 3  | .010 |    |    |
| 19:30         | 29.710                           | 62                  | 59                  | 84                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 20:30         | 29.720                           | 61                  | 59                  | 87                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 21:30         | 29.720                           | 61                  | 58                  | 90                               | 10                       | 10                             | 50             | M5     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 1  | .020 |    |    |
| 22:30         | 29.720                           | 61                  | 59                  | 90                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 23:30         | 29.720                           | 61                  | 59                  | 90                               | 10                       |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |

SYNOPTIC OBSERVATIONS

| TIME<br>(GCT) | TIME<br>(LST) | NO. | PRECIP.<br>(In) | SNOW<br>FALL<br>(In) | SNOW<br>DEPTH<br>(In) | MAX.<br>TEMP.<br>(°F) | MIN.<br>TEMP.<br>(°F) | STATE<br>OF<br>SKY | SEA<br>STATE<br>&<br>DIR. | SWELL<br>HGT. &<br>DIR. | SWELL<br>PERIOD | SURF<br>WAVE<br>HGT. &<br>DIR. | WATER<br>TEMP.<br>(°F) | STATION PRESSURE COMPUTATIONS |        |        |        |      |
|---------------|---------------|-----|-----------------|----------------------|-----------------------|-----------------------|-----------------------|--------------------|---------------------------|-------------------------|-----------------|--------------------------------|------------------------|-------------------------------|--------|--------|--------|------|
| 41            | 42            | 43  | 44              | 45                   | 46                    | 47                    | 48                    | 49                 | 50                        | 51                      | 52              | 53                             | 54                     | 55                            | 56     | 57     | 58     |      |
|               | MID TO        | X   | 0               | 0                    | X                     | 61                    | 60                    | X                  | X                         | X                       | X               | X                              | X                      | 07.55                         | 07.55  | 1055.4 | 1055.4 | 2155 |
|               | 0752          | 1   | 0               | 0                    | 0                     | 61                    | 60                    | 0                  |                           |                         |                 |                                |                        | 1055.4                        | 1055.4 | 1055.4 | 1055.4 | 2155 |
|               | 0852          | 2   | 0               | 0                    | 0                     | 65                    | 63                    | 0                  |                           |                         |                 |                                |                        | 0                             | 0      | 0      | 0      |      |
|               | 1552          | 3   | 0               | 0                    | 0                     | 67                    | 65                    | 0                  |                           |                         |                 |                                |                        | 1055.4                        | 1055.4 | 1055.4 | 1055.4 | 2155 |
|               | 2152          | 4   | 0               | 0                    | 0                     | 66                    | 61                    | 0                  |                           |                         |                 |                                |                        | 1055.4                        | 1055.4 | 1055.4 | 1055.4 | 2155 |
|               | MID           | X   | 0               | 0                    | 0                     | 61                    | 61                    | X                  | X                         | X                       | X               | X                              | X                      |                               |        |        |        |      |

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| PEAK GUSTS             |                        |                                   |                               |                  |       |               |               |    |    | SKY COVER |    | PRECIP. AND THUNDER |    | BEGAN | ENDED | OBSTR. TO VISION | BEGAN | ENDED |
|------------------------|------------------------|-----------------------------------|-------------------------------|------------------|-------|---------------|---------------|----|----|-----------|----|---------------------|----|-------|-------|------------------|-------|-------|
| 24-HR. MAX. TEMP. (°F) | 24-HR. MIN. TEMP. (°F) | 24-HR. PRECIP. WATER EQUIV. (In.) | 24-HR. SNOWFALL UNMELT. (In.) | SNOW DEPTH (In.) | SPEED | DIR. (L.S.T.) | TIME (L.S.T.) | 74 | 75 | 76        | 77 | 78                  | 79 | 80    | 81    | 82               | 83    | 84    |
| 66                     | 60                     | 0                                 | 0                             | 0                | 11    | 44            | 1256          |    |    |           |    | 10                  | 10 |       |       |                  |       |       |

90. REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

|  |                      |      |
|--|----------------------|------|
| FASTEST RECORDED ONE MINUTE WIND SPEED | ASSOCIATED DIRECTION | TIME |
| KNOTS                                  |                      |      |

NOTE: There are no required entries in columns without headings.  
"Any data needed locally may be entered".

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

STATION

UNUSED SAN CLEMENTE ISLAND

DATE

21 JULY 1971

| Type | Time<br>(LST) | Sky and ceiling<br>(hundreds of feet) | visibility<br>(Statute Miles) |       | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>pressure<br>(mb.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind      |                |                            | Altimeter<br>reading<br>(mb.) | Remarks and supplemental code data | Observer's<br>signature<br>(initials) |
|------|---------------|---------------------------------------|-------------------------------|-------|---|-----------------------------------|---------------|--------------------|-----------|----------------|----------------------------|-------------------------------|------------------------------------|---------------------------------------|
|      |               |                                       | Surface                       | Tower |   |                                   |               |                    | Direction | Speed<br>(kts) | Character<br>and<br>shifts |                               |                                    |                                       |
| (1)  | (2)           | (3)                                   | (4)                           | (5)   | (6)   | (7)                               | (8)           | (9)                | (10)      | (11)           | (12)                       | (13)                          | (14)                               | (15)                                  |
| R    | 0000          | E 1-5                                 | 7                             |       |   | 110.1                             | 61            | 58                 | 27        | 105            |                            | 20.3                          | 16//                               | PK                                    |
| R    | 0100          | E 1-5                                 | 7                             |       |   | 110.2                             | 61            | 58                 | 27        | 105            |                            | 20.3                          |                                    | PK                                    |
| R    | 0200          | E 1-5                                 | 7                             |       |   | 110.6                             | 61            | 58                 | 28        | 104            |                            | 20.3                          |                                    | PK                                    |
| RS   | 0300          | M 2-3                                 | 4                             |       | F   | 111.4                             | 61            | 58                 | 27        | 104            |                            | 20.3                          | 707 16// 61                        | PK                                    |
| R    | 0400          | E 1-5                                 | 5                             |       | F   | 111.6                             | 61            | 58                 | 27        | 104            |                            | 20.3                          |                                    | PK                                    |
| RS   | 0500          | E 1-5                                 | 6                             |       | F   | 111.9                             | 61            | 58                 | 27        | 105            |                            | 20.3                          |                                    | PK                                    |
| R    | 0600          | E 1-5                                 | 5                             |       | F   | 111.1                             | 62            | 59                 | 25        | 104            |                            | 20.3                          | 207 16//                           | PK                                    |
| S    | 0705          | A 4-6                                 | 3                             | 3     | F   |                                   |               |                    | 26        | 104            |                            | 20.3                          |                                    | PK                                    |
| R    | 0800          | E 4-6                                 | 5                             |       | F   | 112.0                             | 62            | 59                 | 28        | 104            |                            | 20.3                          |                                    | PK                                    |
| RS   | 0900          | E 5-7                                 | 5                             |       | F   | 113.0                             | 63            | 59                 | 28        | 104            |                            | 20.3                          |                                    | PK                                    |
| R    | 1000          | E 5-9                                 | 5                             |       | H   | 113.0                             | 63            | 58                 | 27        | 104            |                            | 20.3                          | 015 108 16// 61                    | PK                                    |
| R    | 1100          | E 5-9                                 | 5                             |       | H   | 113.2                             | 63            | 58                 | 30        | 103            |                            | 20.3                          |                                    | PK                                    |
| R    | 1200          | E 7-9                                 | 3                             | 3     | H   | 112.3                             | 63            | 58                 | 27        | 105            |                            | 20.3                          |                                    | PK                                    |
| R    | 1300          | E 6-9                                 | 3                             | 3     | H   | 112.6                             | 63            | 58                 | 30        | 106            |                            | 20.3                          | 203 16//                           | PK                                    |
| R    | 1400          | E 5-9                                 | 3                             | 3     | H   | 112.3                             | 63            | 58                 | 26        | 105            |                            | 20.3                          |                                    | PK                                    |
| R    | 1500          | E 6-9                                 | 3                             | 3     | H   | 112.3                             | 63            | 58                 | 29        | 103            |                            | 20.3                          |                                    | PK                                    |
| R    | 1600          | B 5-9                                 | 3                             | 3     | H   | 111.9                             | 63            | 58                 | 23        | 106            |                            | 20.3                          | 708 16// 69                        | PK                                    |
| R    | 1700          | E 5-9                                 | 5                             |       | H   | 114.6                             | 65            | 56                 | 34        | 106            |                            | 20.3                          |                                    | PK                                    |
| R    | 1750          | E 5-9                                 | 5                             |       | H   | 111.6                             | 63            | 58                 | 25        | 107            |                            | 20.3                          |                                    | PK                                    |
| R    | 1800          | B 5-9                                 | 5                             |       | H   | 111.6                             | 62            | 57                 | 27        | 106            |                            | 20.3                          | 502 16//                           | PK                                    |
| R    | 1900          | E 5-9                                 | 5                             |       | H   | 111.6                             | 62            | 58                 | 25        | 106            |                            | 20.3                          |                                    | PK                                    |
| R    | 2000          | E 5-9                                 | 5                             |       | H   | 112.4                             | 62            | 58                 | 26        | 106            |                            | 20.3                          |                                    | PK                                    |
| R    | 2100          | M 6-9                                 | 5                             |       | H   | 113.2                             | 61            | 57                 | 23        | 104            |                            | 20.3                          | 215 16// 69                        | PK                                    |
| R    | 2200          | E 6-9                                 | 5                             |       | H   | 114.0                             | 62            | 57                 | 24        | 105            |                            | 20.3                          |                                    | PK                                    |
| R    | 2300          | E 6-9                                 | 5                             |       | F   | 113.6                             | 62            | 57                 | 23        | 104            |                            | 20.3                          |                                    | PK                                    |

A synoptic observation, in WMO code format ZNN1A, is entered on line following related aviation observation.

STATION **NUSED SANCLEMENTE ISLAND** DATE **21 JULY 1971**

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | TOTAL<br>SKY<br>COVER | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |             |                |        |                              |              | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |    |      |    |    |
|---------------|----------------------------------|---------------------|---------------------|-----------------------------------|-----------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|------------------------------|--------------|---------------------------------|----------------------|-----------------------|----|------|----|----|
|               |                                  |                     |                     |                                   |                       | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |                                 |                      |                       |    |      |    |    |
|               |                                  |                     |                     |                                   |                       | AMT                            | TYPE &<br>DIR. | HEIGHT | AMT          | TYPE &<br>DIR. | HEIGHT |                              | AMT         | TYPE &<br>DIR. | HEIGHT |                              | AMT          | TYPE &<br>DIR.                  | HEIGHT               |                       |    |      |    |    |
| 18            | 17                               | 18                  | 19                  | 20                                | 21                    | 22                             | 23             | 24     | 25           | 26             | 27     | 28                           | 29          | 30             | 31     | 32                           | 33           | 34                              | 35                   | 36                    | 37 | 38   | 39 | 40 |
| 0055          | 29.710                           | 61                  | 59                  | 90                                | 10                    | 10                             | ST             | E6     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 8  | .010 |    |    |
| 0158          | 29.705                           | 61                  | 59                  | 90                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 0252          | 29.695                           | 61                  | 59                  | 90                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 0352          | 29.690                           | 61                  | 59                  | 90                                | 10                    | 10                             | ST             | M3     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 7  | .020 |    |    |
| 0452          | 29.695                           | 61                  | 59                  | 90                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 0555          | 29.705                           | 61                  | 59                  | 90                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 0652          | 29.710                           | 62                  | 60                  | 90                                | 10                    | 10                             | ST             | E6     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 2  | .020 |    |    |
| 0752          | 29.725                           | 62                  | 60                  | 90                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 0852          | 29.735                           | 63                  | 61                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 0952          | 29.735                           | 64                  | 61                  | 84                                | 10                    | 10                             | ST             | B5     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 1  | .025 |    |    |
| 1052          | 29.740                           | 67                  | 61                  | 73                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 1152          | 29.730                           | 68                  | 62                  | 70                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 1252          | 29.725                           | 69                  | 62                  | 68                                | 10                    | 10                             | ST             | B6     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 8  | .010 |    |    |
| 1352          | 29.715                           | 69                  | 62                  | 68                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 1452          | 29.715                           | 68                  | 62                  | 70                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 1552          | 29.700                           | 68                  | 62                  | 70                                | 10                    | 10                             | ST             | B5     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 7  | .025 |    |    |
| 1652          | 29.690                           | 65                  | 60                  | 73                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 1752          | 29.690                           | 63                  | 59                  | 79                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 1852          | 29.695                           | 62                  | 59                  | 84                                | 10                    | 10                             | ST             | B5     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 5  | .005 |    |    |
| 1952          | 29.700                           | 62                  | 60                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 2052          | 29.720                           | 62                  | 60                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 2152          | 29.740                           | 61                  | 59                  | 90                                | 10                    | 10                             | ST             | M6     | U            |                |        |                              | U           |                |        |                              | U            |                                 |                      | 10                    | 2  | .045 |    |    |
| 2252          | 29.745                           | 60                  | 59                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |
| 2352          | 29.750                           | 60                  | 59                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |    |      |    |    |

| SYNOPTIC OBSERVATIONS |               |     |                 |                      |                       |                       |                       |                      |              |              |               |                |   |                |    |    |    | STATION PRESSURE COMPUTATIONS |        |        |        |        |
|-----------------------|---------------|-----|-----------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|--------------|--------------|---------------|----------------|---|----------------|----|----|----|-------------------------------|--------|--------|--------|--------|
| TIME<br>(GCT)         | TIME<br>(LST) | NO. | PRECIP.<br>(In) | SNOW<br>FALL<br>(In) | SNOW<br>DEPTH<br>(In) | MAX.<br>TEMP.<br>(°F) | MIN.<br>TEMP.<br>(°F) | STATE<br>OF<br>CLOUD | SEA<br>STATE | WIND<br>DIR. | WIND<br>SPEED | WIND<br>PERIOD | SURF.<br>H <sub>2</sub> H <sub>2</sub><br>H <sub>2</sub> O <sub>2</sub> | WATER<br>TEMP. |    |    |    | TIME (LST)                    | 0355   | 0755   | 1555   | 2155   |
| 51                    | 42            | 43  | 44              | 45                   | 46                    | 47                    | 48                    | 49                   | 50           | 51           | 52            | 53             | 54  | 55             | 56 | 57 | 58 | 59                            |        |        |        |        |
|                       | MID TO        | X   | 0               | 0                    | X                     | 61                    | 61                    | X                    | X            | X            | X             | X              | X   | X              | X  | X  | X  | ATT. THERM.                   |        |        |        |        |
|                       | 0352          | 1   | 0               | 0                    | 0                     | 61                    | 61                    | 0                    |              |              |               |                |   |                |    |    |    | OBSERV. BAR                   | 1005.4 | 1005.7 | 1005.7 | 1007.1 |
|                       | 0952          | 2   | 0               | 0                    | 0                     | 64                    | 61                    | 0                    |              |              |               |                |   |                |    |    |    | TOTAL CORR.                   | 0      | 0      | 0      | 0      |
|                       | 1552          | 3   | 0               | 0                    | 0                     | 69                    | 64                    | 0                    |              |              |               |                |   |                |    |    |    | STA. PRESS.                   | 1005.4 | 1006.9 | 1005.7 | 1007.1 |
|                       | 2152          | 4   | 0               | 0                    | 0                     | 68                    | 61                    | 0                    |              |              |               |                |   |                |    |    |    | BAROGRAPH                     | 1006.5 | 1007.2 | 1006.0 | 1007.1 |
|                       | MID           | X   | 0               | 0                    | 0                     | 61                    | 60                    | X                    | X            | X            | X             | X              | X   | X              | X  | X  | X  | BAR. CORR.                    | -0.1   | -0.3   | -0.2   | -0.3   |

| SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT) |                                 |   |  |                        |            |       |                      |                  |    |    |    |    |    |    |  |  |  | PRECIP.<br>AND<br>THORSTN. | BEGAN | ENDED | OBSTR.<br>TO<br>VISION | BEGAN | ENDED |
|---------------------------------------|---------------------------------|---|--|------------------------|------------|-------|----------------------|------------------|----|----|----|----|----|----|--|--|--|----------------------------|-------|-------|------------------------|-------|-------|
| 24-HR.<br>MAX.<br>TEMP.<br>(°F)       | 24-HR.<br>MIN.<br>TEMP.<br>(°F) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(In.) | 24-HR.<br>SNOWFALL<br>UNMELT.<br>(In.) | SNOW<br>DEPTH<br>(In.) | PEAK GUSTS | SPEED | DIR.<br>REC-<br>TION | TIME<br>(L.S.T.) |    |    |    |    |    |    |  |  |  |                            |       |       |                        |       |       |
| 68                                    | 67                              | 0   | 0                                      | 0                      |            | 71    | 23                   | 73               | 74 | 75 | 76 | 77 |    |    |  |  |  |                            |       |       | F                      | 0340  | 0910  |
| 63                                    | 60                              | 0   | 0                                      | 0                      |            | 11    | SW                   | 1630             |    |    |    |    | 10 | 10 |  |  |  |                            |       |       | H                      | 0910  | 2330  |

| REMARKS, NOTES AND MISCELLANEOUS PHENOMENA |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | FASTEST RECORDED ONE MINUTE WIND SPEED |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | KNOTS                                  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

WIND & BAROGRAPH: RESET 0955H

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

 STATION  
 NW350 SAN CLEMENTE ISLAND

 DATE  
 22 July 1971

| Type | Time (GMT) | Sky and ceiling (Hundreds of feet) | visibility (Statute miles) |           | weather and obstructions to vision | Sea level press. (Inch.) | Temp. (°F) | Sea pt. (°F) | Wind           |            |                             | Wave height (Feet) | Remarks and supplemental coded data | Observer's initials |
|------|------------|------------------------------------|----------------------------|-----------|------------------------------------|--------------------------|------------|--------------|----------------|------------|-----------------------------|--------------------|-------------------------------------|---------------------|
|      |            |                                    | Surface (1)                | Tower (2) |                                    |                          |            |              | Direction (10) | Force (11) | Character and altitude (12) |                    |                                     |                     |
| R    | 0203       | M5 ⊕                               | 5                          |           | F                                  | 132                      | 50         | 58           | 30             | 02         |                             |                    | 000 16//                            | AR                  |
| R    | 0158       | E5 ⊕                               | 5                          |           | F                                  | 134                      | 60         | 58           | 24             | 02         |                             |                    |                                     | AR                  |
| R    | 0258       | E5 ⊕                               | 5                          |           | F                                  | 132                      | 60         | 58           | 24             | 02         |                             |                    |                                     | AR                  |
| RS   | 0353       | M3 ⊕                               | 3                          | x         | F                                  | 132                      | 55         | 58           | 25             | 02         |                             |                    | 000 16// 60                         | AR                  |
| RS   | 0453       | E3 ⊕                               | 1                          | x         | F                                  | 134                      | 60         | 59           | 00             | 00         |                             |                    |                                     | AR                  |
| R    | 0553       | E5 ⊕                               | 1                          | 1         | F                                  | 138                      | 61         | 60           | 00             | 00         |                             |                    |                                     | AR                  |
| R    | 0658       | B4 ⊕                               | 1                          | 1         | F                                  | 142                      | 61         | 60           | 34             | 01         |                             |                    | 210 16//                            | AR                  |
| R    | 0758       | E4 ⊕                               | 1                          | 1         | F                                  | 146                      | 63         | 61           | 00             | 00         |                             |                    |                                     | AR                  |
| R    | 0858       | E4 ⊕                               | 1                          | 1         | F                                  | 146                      | 64         | 61           | 00             | 00         |                             |                    | 1640 U 16                           | AR                  |
| RS   | 0958       | B6 ⊕                               | 1                          | 1         | F                                  | 141                      | 65         | 61           | 34             | 01         |                             |                    | 103 16// 60 ⊕ 13                    | AR                  |
| RS   | 1058       | E6 ⊕                               | 1/2                        |           | HP                                 | 146                      | 66         | 60           | 20             | 02         |                             |                    |                                     | AR                  |
| R    | 1157       | E6 ⊕                               | 1/2                        |           | HP                                 | 146                      | 65         | 60           | 23             | 02         |                             |                    |                                     | AR                  |
| RS   | 1258       | B4 ⊕                               | 3/4                        |           | HP                                 | 141                      | 67         | 60           | 30             | 04         |                             |                    | 805 16//                            | AR                  |
| RS   | 1358       | E4 ⊕                               | 1 1/2                      | 1 1/2     | HP                                 | 134                      | 68         | 60           | 27             | 04         |                             |                    |                                     | AR                  |
| RS   | 1457       | E6 ⊕                               | 4                          |           | H                                  | 128                      | 67         | 59           | 31             | 05         |                             |                    |                                     | AR                  |
| R    | 1553       | B5 ⊕                               | 4                          |           | H                                  | 124                      | 63         | 58           | 35             | 03         |                             |                    | 715 16// 69                         | AR                  |
| R    | 1653       | E5 ⊕                               | 3                          | x         | H                                  | 125                      | 66         | 58           | 34             | 04         |                             |                    |                                     | AR                  |
| R    | 1753       | E5 ⊕                               | 3                          | x         | H                                  | 126                      | 65         | 58           | 31             | 04         |                             |                    |                                     | AR                  |
| R    | 1853       | B5 ⊕                               | 3                          | x         | H                                  | 126                      | 64         | 58           | 28             | 04         |                             |                    | 302 16//                            | AR                  |
| R    | 1953       | E5 ⊕                               | 3                          | x         | H                                  | 132                      | 63         | 58           | 29             | 04         |                             |                    |                                     | AR                  |
| RS   | 2058       | W2X                                | 1/2                        | x         | F                                  | 137                      | 63         | 60           | 00             | 00         |                             |                    |                                     | AR                  |
| R    | 2153       | W2X                                | 1/2                        | x         | F                                  | 137                      | 63         | 59           | 30             | 04         |                             |                    | 212 69                              | AR                  |
| R    | 2253       | W2X                                | 3/4                        | x         | F                                  | 138                      | 62         | 58           | 29             | 05         |                             |                    |                                     | AR                  |
| R    | 2358       | W2X                                | 3/4                        | x         | LF                                 | 139                      | 61         | 58           | 26             | 05         |                             |                    | 1635                                | AR                  |

A synoptic observation, in WMO code format FMI1A, is entered on line following related aviation observation.

STATION UNSEEN SAN CLEMENTE ISLAND DATE 22 JULY 1971

| TIME<br>(LST) | STATION<br>PRES.<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | TUM-<br>2<br>IN CLOUD | CLOUDS AND OBSCURING PHENOMENA |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  |    | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |  |  |
|---------------|----------------------------------|---------------------|---------------------|-----------------------------------|-----------------------|--------------------------------|---------------|--------|--------------|---------------|--------|------------------------------|-------------|---------------|--------|------------------------------|--------------|---------------|--------|--|----|---------------------------------|----------------------|-----------------------|--|--|
|               |                                  |                     |                     |                                   |                       | LOWEST LAYER                   |               |        | SECOND LAYER |               |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |               |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |               |        |  |    |                                 |                      |                       |  |  |
|               |                                  |                     |                     |                                   |                       | AMT                            | TYPE &<br>DIR | HEIGHT | AMT          | TYPE &<br>DIR | HEIGHT |                              | AMT         | TYPE &<br>DIR | HEIGHT |                              | AMT          | TYPE &<br>DIR | HEIGHT |  |    |                                 |                      |                       |  |  |
| 18-<br>0058   | 29.740                           | 60                  | 59                  | 23                                | 10                    | 10                             | ST            | MS     | 4            | -             | -      |                              | 4           |               |        |                              | 4            |               |        |  | 10 | 0                               | .002                 |                       |  |  |
| 0158          | 29.745                           | 60                  | 59                  | 23                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 0258          | 29.740                           | 60                  | 59                  | 23                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 0358          | 29.740                           | 60                  | 59                  | 23                                | 10                    | 10                             | ST            | MS     | 4            |               |        |                              | 4           |               |        |                              | 4            |               |        |  | 10 | 0                               | .006                 |                       |  |  |
| 0458          | 29.745                           | 60                  | 59                  | 26                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 0558          | 29.760                           | 61                  | 60                  | 27                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 0658          | 29.770                           | 61                  | 60                  | 27                                | 10                    | 10                             | ST            | MS     | 4            | U             |        |                              | U           |               |        |                              | U            |               |        |  | 10 | 2                               | .030                 |                       |  |  |
| 0758          | 29.780                           | 63                  | 62                  | 29                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 0858          | 29.780                           | 64                  | 62                  | 29                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 0958          | 29.780                           | 65                  | 62                  | 27                                | 10                    | 10                             | ST            | MS     | 4            | U             |        |                              | U           |               |        |                              | U            |               |        |  | 10 | 1                               | .010                 |                       |  |  |
| 1058          | 29.780                           | 65                  | 62                  | 27                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 1158          | 29.785                           | 65                  | 62                  | 27                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 1258          | 29.765                           | 67                  | 62                  | 27                                | 10                    | 10                             | ST            | MS     | 4            | U             |        |                              | U           |               |        |                              | U            |               |        |  | 10 | 8                               | .015                 |                       |  |  |
| 1358          | 29.745                           | 67                  | 63                  | 26                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 1458          | 29.730                           | 67                  | 63                  | 26                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 1558          | 29.720                           | 68                  | 62                  | 26                                | 10                    | 10                             | ST            | MS     | 4            |               |        |                              | 4           |               |        |                              | 4            |               |        |  | 10 | 7                               | .045                 |                       |  |  |
| 1658          | 29.715                           | 66                  | 61                  | 25                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 1758          | 29.715                           | 65                  | 61                  | 28                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 1858          | 29.725                           | 64                  | 60                  | 31                                | 10                    | 10                             | ST            | MS     | 4            |               |        |                              | 4           |               |        |                              | 4            |               |        |  | 10 | 3                               | .005                 |                       |  |  |
| 1958          | 29.740                           | 63                  | 60                  | 34                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 2058          | 29.755                           | 63                  | 61                  | 30                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 2158          | 29.760                           | 63                  | 61                  | 28                                | 10                    | 10                             | F             | MS     | 4            |               |        |                              | 4           |               |        |                              | 4            |               |        |  | 10 | 2                               | .035                 |                       |  |  |
| 2258          | 29.760                           | 62                  | 60                  | 28                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |
| 2358          | 29.760                           | 61                  | 59                  | 29                                | 10                    |                                |               |        |              |               |        |                              |             |               |        |                              |              |               |        |  | 10 |                                 |                      |                       |  |  |

SYNOPTIC OBSERVATIONS

| TIME (GCT) | TIME (LST) | NO. | PRECIP. (In) | SNOW FALL (In) | SNOW DEPTH (In) | MAX. TEMP. (°F) | MIN. TEMP. (°F) | STATE OF CLOUD | SEA STATE | SWELL STATE | SWELL PERIOD | SURF WAVE H <sub>1/3</sub> | WATER TEMP. | STATION PRESSURE COMPUTATIONS |        |        |        |
|------------|------------|-----|--------------|----------------|-----------------|-----------------|-----------------|----------------|-----------|-------------|--------------|----------------------------|-------------|-------------------------------|--------|--------|--------|
| 0158       | 0752       | 1   | 0            | 0              | 0               | 60              | 60              | 0              | 0         | 0           | 0            | 0                          | 0           | 0355                          | 1755   | 1555   | 2155   |
| 0358       | 0952       | 2   | 0            | 0              | 0               | 61              | 60              | 0              | 0         | 0           | 0            | 0                          | 0           | 1007.0                        | 1007.4 | 1006.4 | 1007.8 |
| 0558       | 1152       | 3   | 0            | 0              | 0               | 65              | 60              | 0              | 0         | 0           | 0            | 0                          | 0           | 6                             | 0      | 0      | 0      |
| 0758       | 1352       | 4   | 0            | 0              | 0               | 63              | 63              | 0              | 0         | 0           | 0            | 0                          | 0           | 1007.0                        | 1007.4 | 1006.4 | 1007.8 |
| 0958       | 1552       | 5   | 0            | 0              | 0               | 63              | 63              | 0              | 0         | 0           | 0            | 0                          | 0           | 1006.6                        | 1007.2 | 1006.2 | 1007.8 |
| 1158       | 1752       | 6   | 0            | 0              | 0               | 63              | 63              | 0              | 0         | 0           | 0            | 0                          | 0           | 20                            | 40     | 20     | 40     |

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| 24-HR. MAX. TEMP. (°F) | 24-HR. MIN. TEMP. (°F) | 24-HR. PRECIP. (In) | 24-HR. SNOW FALL (In) | 24-HR. SNOW DEPTH (In) | 24-HR. WIND SPEED (Knots) | 24-HR. WIND DIR. (°) | 24-HR. WIND GUSTS (Knots) | 24-HR. WIND VELOCITY (Knots) | 24-HR. WIND DIRECTION (°) | 24-HR. WIND FORCE (Knots) | 24-HR. WIND STATE (Knots) | 24-HR. WIND PERIOD (Knots) | 24-HR. WAVE H <sub>1/3</sub> | 24-HR. WATER TEMP. (°F) | 24-HR. STATION PRESS. (In) | 24-HR. STATION PRESS. TENDENCY | 24-HR. STATION PRESS. CHANGE |
|------------------------|------------------------|---------------------|-----------------------|------------------------|---------------------------|----------------------|---------------------------|------------------------------|---------------------------|---------------------------|---------------------------|----------------------------|------------------------------|-------------------------|----------------------------|--------------------------------|------------------------------|
| 68                     | 67                     | 0                   | 0                     | 0                      | 71                        | 71                   | 71                        | 71                           | 71                        | 71                        | 71                        | 71                         | 71                           | 68                      | 1007.0                     | 1007.4                         | 1006.4                       |
| 69                     | 67                     | 0                   | 0                     | 0                      | 71                        | 71                   | 71                        | 71                           | 71                        | 71                        | 71                        | 71                         | 71                           | 68                      | 1007.0                     | 1007.4                         | 1006.4                       |

REMARKS, NOTE, AND MISCELLANEOUS PHENOMENA

| FASTEST RECORDED ONE MINUTE WIND SPEED | ASSOCIATED DIRECTION | TIME |
|--|----------------------|------|
| 71                                     | 71                   | 71   |

NOTE: There are no required entries in columns without headings.  
"Any data needed locally may be entered".

\* TOWER ANY MANNED

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

STATION

NWSEB San Clemente Island

DATE

23 July 1971

Remarks and supplemental coded data

| Type | Time (LST) | Sky and visibility (Hundreds of feet) | Visibility (Statute Miles) |      | Weather and obstructions to vision | Sea level press. (Hgs.) | Temp. (°F) | Dew pt. (°F) | Wind      |       |                      | Air temp. (°F) | Wet bulb temp. (°F) | Wet bulb globe temp. (°F) | Remarks and supplemental coded data | Remarks and supplemental coded data | Remarks and supplemental coded data |
|------|------------|---------------------------------------|----------------------------|------|------------------------------------|-------------------------|------------|--------------|-----------|-------|----------------------|----------------|---------------------|---------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|      |            |                                       | Surface                    | Time |                                    |                         |            |              | Direction | Speed | Character and source |                |                     |                           |                                     |                                     |                                     |
| (1)  | (2)        | (3)                                   | (4)                        | (5)  | (6)                                | (7)                     | (8)        | (9)          | (10)      | (11)  | (12)                 | (13)           | (14)                | (15)                      | (16)                                | (17)                                | (18)                                |
| R    | 0000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        |                                     |                                     |                                     |
| R    | 0200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        |                                     |                                     |                                     |
| R    | 0300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 126                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 2100060                             |                                     |                                     |
| R    | 0400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 126                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        |                                     |                                     |                                     |
| R    | 0500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 126                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 2300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0700       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0800       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 0900       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1000       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1100       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1200       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1300       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1400       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1500       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           | 27        | 103   |                      | 72             | 72                  | 72                        | 202                                 | 16                                  |                                     |
| R    | 1600       | W2X                                   | 1/2                        | 1/2  | L-E                                | 127                     | 62         | 57           |           |       |                      |                |                     |                           |                                     |                                     |                                     |

STATION NWSF SAN CLEMENTE Island DATE 23 July 1971

| TIME (LST) |        | STATION PRES-SURE (In) | DRY BULB (°F) | WET BULB (°F) | REL. HUMIDITY (%) | TOTAL SKY COVER | CLOUDS AND OBSCURING PHENOMENA |            |        |              |            |        |                 |             |            |        | TOTAL OPAQUE SKY COVER | PRESSURE TENDENCY | NET 3-HR CHANGE |        |    |      |    |    |  |
|------------|--------|------------------------|---------------|---------------|-------------------|-----------------|--------------------------------|------------|--------|--------------|------------|--------|-----------------|-------------|------------|--------|------------------------|-------------------|-----------------|--------|----|------|----|----|--|
|            |        |                        |               |               |                   |                 | LOWEST LAYER                   |            |        | SECOND LAYER |            |        | SUMMATION TOTAL | THIRD LAYER |            |        | SUMMATION TOTAL        | FOURTH LAYER      |                 |        |    |      |    |    |  |
|            |        |                        |               |               |                   |                 | AMT                            | TYPE & DIR | HEIGHT | AMT          | TYPE & DIR | HEIGHT |                 | AMT         | TYPE & DIR | HEIGHT |                        | AMT               | TYPE & DIR      | HEIGHT |    |      |    |    |  |
| 16         | 17     | 18                     | 19            | 20            | 21                | 22              | 23                             | 24         | 25     | 26           | 27         | 28     | 29              | 30          | 31         | 32     | 33                     | 34                | 35              | 36     | 37 | 38   | 39 | 40 |  |
| 0058       | 29.755 | 60                     | 59            | 93            | 10                | 10              | F                              | W2         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 2  | .005 |    |    |  |
| 0158       | 29.745 | 60                     | 59            | 93            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 0258       | 29.735 | 60                     | 59            | 93            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 0358       | 29.725 | 60                     | 59            | 96            | 10                | 10              | F                              | W2         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 2  | .030 |    |    |  |
| 0458       | 29.725 | 60                     | 59            | 93            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 0558       | 29.720 | 60                     | 59            | 96            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 0658       | 29.755 | 60                     | 59            | 96            | 10                | 10              | F                              | W3         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 2  | .035 |    |    |  |
| 0758       | 29.755 | 61                     | 61            | 100           | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 0858       | 29.755 | 62                     | 61            | 97            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 0958       | 29.755 | 62                     | 61            | 97            | 10                | 10              | F                              | W3         | L      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 4  | .000 |    |    |  |
| 1058       | 29.755 | 62                     | 62            | 98            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 1158       | 29.745 | 64                     | 61            | 87            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 1258       | 29.720 | 65                     | 61            | 81            | 10                | 10              | F                              | W4         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 2  | .035 |    |    |  |
| 1358       | 29.705 | 67                     | 62            | 75            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 1458       | 29.690 | 69                     | 63            | 70            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 1558       | 29.680 | 68                     | 62            | 73            | 10                | 10              | Sc                             | FS         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 7  | .040 |    |    |  |
| 1658       | 29.670 | 68                     | 61            | 75            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 1758       | 29.660 | 67                     | 60            | 74            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 1858       | 29.670 | 62                     | 58            | 81            | 10                | 10              | Sc                             | FS         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 5  | .010 |    |    |  |
| 1958       | 29.680 | 61                     | 59            | 90            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 2058       | 29.675 | 61                     | 59            | 90            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 2158       | 29.685 | 61                     | 59            | 90            | 10                | 10              | F                              | W2         | U      |              |            |        | U               |             |            |        | U                      |                   |                 | 10     | 1  | .025 |    |    |  |
| 2258       | 29.690 | 63                     | 60            | 85            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |
| 2358       | 29.710 | 69                     | 68            | 95            | 10                |                 |                                |            |        |              |            |        |                 |             |            |        |                        |                   |                 | 10     |    |      |    |    |  |

## SYNOPTIC OBSERVATIONS

| TIME<br>(GCT) | TIME<br>(LST) | NO. | PRECIP.<br>(In) | SNOW<br>FALL<br>(In) | SNOW<br>DEPTH<br>(In) | MAX.<br>TEMP.<br>(°F) | MIN.<br>TEMP.<br>(°F) | STATE<br>OF<br>CLOUD | SEA<br>STATE<br>B DIR. | SWELL<br>HGT.<br>DIR. | SWELL<br>PERIOD | WIND<br>H <sub>1</sub> H <sub>2</sub> H <sub>3</sub> | WATER<br>TEMP. |    |    | STATION PRESSURE COMPUTATIONS |    |                   |        |        |        |        |
|---------------|---------------|-----|-----------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|------------------------|-----------------------|-----------------|--|----------------|----|----|-------------------------------|----|-------------------|--------|--------|--------|--------|
| 41            | 42            | 43  | 44              | 45                   | 46                    | 47                    | 48                    | 49                   | 50                     | 51                    | 52              | 53   | 54             | 55 | 56 | 57                            | 58 | TIME (LST)<br>59  | 0355   | 0455   | 1555   | 2155   |
|               | NIB TO        | X   | T               | 0                    | X                     | 61                    | 60                    | X                    | X                      | X                     | X               | X  | X              | X  | X  | X                             | X  | ATT. THERM.<br>60 |        |        |        |        |
| 0752          | 1             | T   | 0               | 0                    |                       | 63                    | 60                    | 3                    |                        |                       |                 |  |                |    |    |                               |    | OBSV'D. BAR<br>61 | 1006.4 | 1007.6 | 1008.0 | 1008.2 |
| 0752          | 2             | T   | 0               | 0                    |                       | 62                    | 60                    | 1                    |                        |                       |                 |  |                |    |    |                               |    | TOTAL CORR.<br>62 | 0      | 0      | 0      | 0      |
| 1552          | 3             | T   | 0               | 0                    |                       | 69                    | 62                    | 0                    |                        |                       |                 |  |                |    |    |                               |    | STA. PRESS.<br>63 | 1006.1 | 1007.2 | 1008.0 | 1008.2 |
| 2152          | 4             | 0   | 0               | 0                    |                       | 68                    | 61                    | 0                    |                        |                       |                 |  |                |    |    |                               |    | BAROGRAPH<br>64   | 306.4  | 1007.2 | 1008.0 | 1008.2 |
|               | NIB           | X   | 0               | 0                    | 0                     | 61                    | 59                    | X                    | X                      | X                     | X               | X  | X              | X  | X  | X                             | X  | BAR. CORR.<br>65  | 40.2   | +0.4   | 0      | - 4    |

**SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)**

[illegible]

|  |                      |
|--|----------------------|
| 90. REMARKS, NOTES AND MISCELLANEOUS PHENOMENA |                      |
| FASTEST RECORDED ONE MINUTE WIND SPEED         | ASSOCIATED DIRECTION |

## KNOTS

**NOTE:** There are no required entries in columns without headings.  
 \*Any data needed locally may be entered\*.

\* Tower 1- 2400

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

 STATION  
 NUWSED, SAN CLEMENTE ISLAND  
 DATE  
 24 July 1971

| Type   | Time (GMT) | Sky and ceiling (Hundreds of Feet) | visibility (Statute Miles) |       | Weather and obstructions to vision | Sea level pressure (Hgs.) | Temp. (°F) | Dew pt. (°F) | Wind      |             |                      | Air-sea interface temp. (°F) | Remarks and supplemental coded data | Observer's initials |
|--------|------------|------------------------------------|----------------------------|-------|------------------------------------|---------------------------|------------|--------------|-----------|-------------|----------------------|------------------------------|-------------------------------------|---------------------|
|        |            |                                    | Surface                    | Tower |                                    |                           |            |              | Direction | Speed (Kts) | Character and shifts |                              |                                     |                     |
| R 0655 | 0655       | W 3 V                              | 7                          | *     | F                                  | 112                       | 54         | 55           | 21        | 100         |                      | 55                           | 003                                 |                     |
| R 0755 | 0755       | W 4 V                              | 7                          | *     | F                                  | 112                       | 54         | 55           | 22        | 100         |                      | 55                           |                                     | BK                  |
| R 0855 | 0855       | W 3 V                              | 2                          | *     | F                                  | 111                       | 52         | 57           | 00        | 100         |                      | 55                           |                                     | BK                  |
| R 0955 | 0955       | W 4 V                              | 2                          | *     | F                                  | 111                       | 52         | 57           | 00        | 100         |                      | 55                           | 21605 59                            | BK                  |
| R 1055 | 1055       | W 2 V                              | 1                          | *     | L-F                                | 111                       | 52         | 57           | 00        | 100         |                      | 55                           | 6340                                | BK                  |
| R 1155 | 1155       | W 2 V                              | 1                          | *     | L-F                                | 116                       | 52         | 52           | 20        | 103         |                      | 55                           | 510                                 | BK                  |
| R 1255 | 1255       | W 3 V                              | 1                          | *     | L-F                                | 118                       | 52         | 51           | 21        | 103         |                      | 55                           | 30                                  | BK                  |
| R 1355 | 1355       | W 4 V                              | 1 1/2                      | *     | L-F                                | 121                       | 52         | 51           | 23        | 102         |                      | 55                           |                                     | BK                  |
| R 1455 | 1455       | W 4 V                              | 1 1/2                      | *     | L-F                                | 125                       | 51         | 50           | 22        | 102         |                      | 55                           |                                     | BK                  |
| R 1555 | 1555       | W 4 V                              | 1                          | *     | L-F                                | 125                       | 51         | 50           | 23        | 102         |                      | 55                           | 21301 59                            | BK                  |
| R 1655 | 1655       | W 4 V                              | 1                          | *     | F                                  | 126                       | 51         | 50           | 20        | 100         |                      | 55                           | 1845                                | BK                  |
| R 1755 | 1755       | W 4 V                              | 1 1/2                      | *     | F                                  | 126                       | 52         | 52           | 24        | 103         |                      | 55                           | F4                                  | BK                  |
| R 1855 | 1855       | W 4 V                              | 3                          | *     | F                                  | 121                       | 52         | 52           | 22        | 104         |                      | 55                           | F2 805                              | BK                  |
| R 1955 | 1955       | W 4 V                              | 5                          | *     | H                                  | 116                       | 52         | 52           | 21        | 105         |                      | 55                           | WVN SHFT 40 2140                    | BK                  |
| R 2055 | 2055       | W 4 V                              | 5                          | *     | H                                  | 113                       | 52         | 52           | 34        | 106         |                      | 55                           | 210                                 | BK                  |
| R 2155 | 2155       | W 4 V                              | 5                          | *     | H                                  | 111                       | 66         | 57           | 33        | 104         |                      | 55                           | 210015-11 67                        | BK                  |
| R 2255 | 2255       | W 4 V                              | 4                          | *     | H                                  | 107                       | 66         | 53           | 30        | 106         |                      | 55                           |                                     | BK                  |
| R 2355 | 2355       | W 4 V                              | 3                          | *     | H                                  | 111                       | 64         | 57           | 30        | 103         |                      | 55                           |                                     | BK                  |
| R 0055 | 0055       | W 4 V                              | 3                          | *     | H                                  | 113                       | 62         | 56           | 29        | 105         |                      | 55                           | 302 1611                            | BK                  |
| R 0155 | 0155       | W 4 V                              | 3                          | *     | H                                  | 116                       | 62         | 57           | 28        | 102         |                      | 55                           |                                     | BK                  |
| R 0255 | 0255       | W 4 V                              | 3                          | *     | H                                  | 126                       | 61         | 53           | 00        | 100         |                      | 55                           |                                     | BK                  |
| R 0355 | 0355       | W 4 V                              | 3                          | *     | H                                  | 130                       | 53         | 57           | 30        | 103         |                      | 55                           | 217 1611 67                         | BK                  |
| R 0455 | 0455       | W 4 V                              | 3                          | *     | H                                  | 130                       | 62         | 57           | 24        | 102         |                      | 55                           |                                     | BK                  |
| R 0555 | 0555       | W 4 V                              | 3                          | *     | H                                  | 128                       | 62         | 57           | 20        | 100         |                      | 55                           |                                     | BK                  |

A synoptic observation, in WMO code format FILLIA, is entered on line following related aviation observation.

STATION **UNSEED SAN CLEMENTE ISLAND**

DATE **24 July 71**

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(Inch) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | TOTAL<br>SKY<br>COVER | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |             |                |        |                              |              | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |      |    |                |        |
|---------------|------------------------------------|---------------------|---------------------|-----------------------------------|-----------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|------------------------------|--------------|---------------------------------|----------------------|-----------------------|------|----|----------------|--------|
|               |                                    |                     |                     |                                   |                       | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |                                 |                      |                       |      |    |                |        |
|               |                                    |                     |                     |                                   |                       | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |                              | AMT.        | TYPE &<br>DIR. | HEIGHT |                              | AMT.         |                                 |                      |                       |      |    | TYPE &<br>DIR. | HEIGHT |
| 16            | 17                                 | 18                  | 19                  | 20                                | 21                    | 22                             | 23             | 24     | 25           | 26             | 27     | 28                           | 29          | 30             | 31     | 32                           | 33           | 34                              | 35                   | 36                    | 37   | 38 | 39             | 40     |
| 0055          | 29.605                             | 59                  | 58                  | 96                                | 10                    | 10                             | F              | W3     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 0                     | .010 |    |                |        |
| 0152          | 29.600                             | 59                  | 58                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 0252          | 29.680                             | 59                  | 58                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 0352          | 29.680                             | 59                  | 58                  | 93                                | 10                    | 10                             | F              | W3     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 6                     | .010 |    |                |        |
| 0453          | 29.680                             | 59                  | 58                  | 96                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 0552          | 29.695                             | 59                  | 58                  | 96                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 0654          | 29.600                             | 60                  | 59                  | 96                                | 10                    | 10                             | F              | W3     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 3                     | .020 |    |                |        |
| 0755          | 29.710                             | 60                  | 59                  | 96                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 0855          | 29.705                             | 61                  | 60                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 0955          | 29.725                             | 61                  | 60                  | 93                                | 10                    | 10                             | F              | W4     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 2                     | .035 |    |                |        |
| 1055          | 29.725                             | 61                  | 60                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 1152          | 29.725                             | 62                  | 60                  | 93                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 1255          | 29.710                             | 64                  | 61                  | 84                                | 10                    | 2                              | F              | -      | 8            | SE             | EG     | 10                           | U           |                |        |                              |              |                                 | 10                   | 8                     | .025 |    |                |        |
| 1355          | 29.685                             | 66                  | 60                  | 73                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 1455          | 29.685                             | 67                  | 61                  | 70                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 1555          | 29.680                             | 66                  | 60                  | 73                                | 10                    | 10                             | st             | EB     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 7                     | .030 |    |                |        |
| 1653          | 29.675                             | 66                  | 61                  | 75                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 1755          | 29.631                             | 64                  | 60                  | 70                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 1855          | 29.635                             | 62                  | 58                  | 81                                | 10                    | 10                             | st             | EG     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 3                     | .005 |    |                |        |
| 1955          | 29.695                             | 62                  | 59                  | 84                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 2055          | 29.725                             | 64                  | 60                  | 81                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 2155          | 29.735                             | 63                  | 59                  | 82                                | 10                    | 10                             | st             | M6     | U            |                |        |                              | U           |                |        |                              |              |                                 | 10                   | 2                     | .050 |    |                |        |
| 2255          | 29.735                             | 62                  | 59                  | 84                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |
| 2355          | 29.721                             | 62                  | 59                  | 84                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                              |              |                                 |                      | 10                    |      |    |                |        |

SYNOPTIC OBSERVATIONS

| TIME<br>(GST) | TIME<br>(LST) | NO. | PRECIP.<br>(Inch) | SNOW<br>FALL<br>(Inch) | SNOW<br>DEPTH<br>(Inch) | MAX.<br>TEMP.<br>(°F) | MIN.<br>TEMP.<br>(°F) | STATE<br>OF<br>SKY | SEA<br>STATE | SWELL<br>DIR. | SWELL<br>PERIOD | SURF<br>WAVE<br>PERIOD | WATER<br>TEMP. | STATION PRESSURE COMPUTATIONS |    |    |    |
|---------------|---------------|-----|-------------------|------------------------|-------------------------|-----------------------|-----------------------|--------------------|--------------|---------------|-----------------|------------------------|----------------|-------------------------------|----|----|----|
| 41            | 42            | 43  | 44                | 45                     | 46                      | 47                    | 48                    | 49                 | 50           | 51            | 52              | 53                     | 54             | 55                            | 56 | 57 | 58 |
|               | MID TO        |     | 0                 | 0                      | 0                       | 59                    | 59                    |                    |              |               |                 |                        |                |                               |    |    |    |
|               | 0552          | 1   | 0                 | 0                      | 0                       | 61                    | 59                    | 0                  |              |               |                 |                        |                |                               |    |    |    |
|               | 1052          | 2   | .01               | 0                      | 0                       | 61                    | 59                    | 1                  |              |               |                 |                        |                |                               |    |    |    |
|               | 1555          | 3   | T                 | 0                      | 0                       | 67                    | 61                    | 0                  |              |               |                 |                        |                |                               |    |    |    |
|               | 2052          | 4   | 0                 | 0                      | 0                       | 66                    | 62                    | 0                  |              |               |                 |                        |                |                               |    |    |    |
|               | MID           |     | 0                 | 0                      | 0                       | 67                    | 62                    |                    |              |               |                 |                        |                |                               |    |    |    |

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| 24-HR.<br>MAX.<br>TEMP.<br>(°F) | 24-HR.<br>MIN.<br>TEMP.<br>(°F) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(Inch) | 24-HR.<br>SNOWFALL<br>UNMELT<br>(Inch) | SNOW<br>DEPTH<br>(Inch) | PEAK GUSTS |                                 |                  | SKY COVER                           |  |    |    | AND<br>THORSTM.<br>82 | BEGAN<br>83 | ENDED<br>84 | TO<br>VISION<br>85 | BEGAN<br>87 | ENDED<br>88 |
|---------------------------------|---------------------------------|--|--|-------------------------|------------|---------------------------------|------------------|-------------------------------------|--|----|----|-----------------------|-------------|-------------|--------------------|-------------|-------------|
|                                 |                                 |  |  |                         | SPEED      | 91-<br>REC.<br>TIME<br>(L.S.T.) | TIME<br>(L.S.T.) | SUN-<br>SHINE<br>TO<br>SUNSET<br>78 | MID-<br>NIGHT<br>TO<br>MID-<br>NIGHT<br>79 | 80 | 81 |                       |             |             |                    |             |             |
|                                 |                                 |  |  |                         |            |                                 |                  |                                     |  |    |    |                       |             |             |                    |             |             |
| 66                              | 67                              | 68   | 69                                     | 70                      | 71         | 30                              | 73               | 74                                  | 75   | 76 | 77 | L                     | 0430        | 0510        | F                  | Cont.       | 1300        |
| 67                              | 59                              | .01  | 0                                      | 0                       | 8          | 1758                            |                  |                                     |  |    |    | L                     | 0510        | 1045        | W                  | 1750        | 2007        |

90. REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

FASTEST RECORDED ONE MINUTE WIND SPEED

ASSOCIATED DIRECTION

TIME

KNOTS

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

\* TOWER NOT MANNED

DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

STATION UNSED SAN CLEMENTE ISLAND

DATE 25 July 1971

| Type | Time (GMT) | Sky and ceiling (Hundreds of Feet) | Visibility (Statute Miles) |       | Weather and obstructions to vision | Sea level pressure (Hpa.) | Temp. (°F) | Sea (°F) | Wind      |             |              | Air temp. at 2m (°F) | Remarks and supplemental coded data |      |                 |
|------|------------|------------------------------------|----------------------------|-------|------------------------------------|---------------------------|------------|----------|-----------|-------------|--------------|----------------------|-------------------------------------|------|-----------------|
|      |            |                                    | Surface                    | Tower |                                    |                           |            |          | Direction | Speed (Kts) | Character of |                      |                                     |      |                 |
| (1)  | (2)        | (3)                                | (4)                        | (5)   | (6)                                | (7)                       | (8)        | (9)      | (10)      | (11)        | (12)         | (13)                 | (14)                                | (15) | (16)            |
| R    | 0752       | E 3 0                              | 3                          | 4     | H                                  | 121                       | 42         | 57       | 23        | 07          |              | 724                  | 808                                 | 1611 | 17              |
| R    | 0803       | E 3 0                              | 3                          | 4     | H                                  | 124                       | 41         | 57       | 00        | 00          |              | 723                  |                                     |      | 17              |
| R    | 0818       | E 6 0                              | 3                          | 4     | H                                  | 124                       | 41         | 57       | 23        | 03          |              | 723                  |                                     |      | 17              |
| R    | 0833       | E 3 0                              | 3                          | 4     | H                                  | 124                       | 41         | 57       | 20        | 00          |              | 723                  | 102                                 | 1611 | 61              |
| R    | 0848       | E 3 0                              | 3                          | 4     | H                                  | 120                       | 41         | 57       | 27        | 04          |              | 721                  |                                     |      | 17              |
| R    | 0857       | E 3 0                              | 4                          |       | H                                  | 130                       | 41         | 58       | 25        | 03          |              | 722                  |                                     |      | 17              |
| R    | 0908       | E 1 0                              | 4                          |       | H                                  | 132                       | 61         | 58       | 00        | 00          |              | 722                  | 207                                 | 1611 | 17              |
| R    | 0917       | E 1 0                              | 4                          |       | H                                  | 132                       | 61         | 58       | 23        | 02          |              | 722                  |                                     |      | 17              |
| R    | 0928       | E 6 0                              | 4                          |       | H                                  | 132                       | 63         | 57       | 28        | 02          |              | 722                  |                                     |      | 17              |
| R    | 0938       | E 6 0                              | 4                          |       | H                                  | 134                       | 64         | 58       | 27        | 03          |              | 723                  | 302                                 | 1611 | 61              |
| R    | 0958       | E 6 0                              | 4                          |       | H                                  | 136                       | 65         | 58       | 30        | 02          |              | 723                  |                                     |      | 17              |
| R    | 1008       | E 6 0                              | 4                          |       | H                                  | 134                       | 65         | 58       | 22        | 02          |              | 723                  |                                     |      | 17              |
| R    | 1058       | E 7 0                              | 4                          |       | H                                  | 132                       | 67         | 57       | 24        | 04          |              | 722                  | 802                                 | 1611 | 17              |
| R    | 1108       | A 10 0                             | 4                          |       | H                                  | 126                       | 67         | 56       | 25        | 05          |              | 721                  |                                     |      | 17              |
| R    | 1158       | A 11 0                             | 5                          |       | H                                  | 124                       | 68         | 56       | 27        | 08          |              | 720                  | 615                                 |      | 17              |
| R    | 1208       | E 11 0                             | 4                          |       | H                                  | 121                       | 67         | 56       | 27        | 08          |              | 724                  | 710                                 | 1511 | 68              |
| R    | 1218       | E 11 0                             | 5                          |       | H                                  | 114                       | 66         | 56       | 27        | 06          |              | 727                  |                                     |      | 17              |
| R    | 1228       | E 11 0                             | 5                          |       | H                                  | 114                       | 65         | 56       | 31        | 06          |              | 727                  |                                     |      | 17              |
| R    | 1238       | E 11 0                             | 5                          |       | H                                  | 123                       | 63         | 56       | 30        | 05          |              | 720                  | 500                                 | 1511 | SLP 121 ALT 889 |
| R    | 1248       | E 10 0                             | 5                          |       | H                                  | 124                       | 63         | 57       | 29        | 06          |              | 720                  |                                     |      | 17              |
| R    | 1253       | E 10 0                             | 5                          |       | H                                  | 132                       | 63         | 57       | 27        | 02          |              | 722                  |                                     |      | 17              |
| R    | 1308       | E 10 0                             | 5                          |       | H                                  | 132                       | 62         | 57       | 30        | 03          |              | 722                  | 110                                 | 1511 | 68              |
| R    | 1318       | E 10 0                             | 4                          |       | H                                  | 132                       | 62         | 56       | 28        | 04          |              | 722                  |                                     |      | 17              |
| R    | 1328       | E 10 0                             | 5                          |       | H                                  | 132                       | 60         | 56       | 27        | 06          |              | 722                  |                                     |      | 17              |

A synoptic observation, in WMO code format PW14, is entered on line following related aviation observation.

OPNAV FORM 3140-7 (4-66)  
0187-711-1001DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

VRAN 10B

STATION NUSED SAN CLEMENTE ISLAND DATE 26 JULY 1971

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | TOTAL<br>SKY COVER | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |             |                |        |                              |              |                |        |    |    | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |  |  |
|---------------|----------------------------------|---------------------|---------------------|-----------------------------------|--------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|------------------------------|--------------|----------------|--------|----|----|---------------------------------|----------------------|-----------------------|--|--|
|               |                                  |                     |                     |                                   |                    | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |                |        |    |    |                                 |                      |                       |  |  |
|               |                                  |                     |                     |                                   |                    | AMT                            | TYPE &<br>DIR. | HEIGHT | AMT          | TYPE &<br>DIR. | HEIGHT |                              | AMT         | TYPE &<br>DIR. | HEIGHT |                              | AMT          | TYPE &<br>DIR. | HEIGHT |    |    |                                 |                      |                       |  |  |
| 16            | 17                               | 18                  | 19                  | 20                                | 21                 | 22                             | 23             | 24     | 25           | 26             | 27     | 28                           | 29          | 30             | 31     | 32                           | 33           | 34             | 35     | 36 | 37 | 38                              | 39                   | 40                    |  |  |
| 0058          | 29.730                           | 60                  | 58                  | 67                                | 10                 | 10                             | ST             | EL     | U            |                |        |                              | U           |                |        |                              | U            |                |        | 10 | 8  | 0.10                            |                      |                       |  |  |
| 0158          | 29.725                           | 60                  | 58                  | 67                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 0258          | 29.725                           | 60                  | 58                  | 67                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 0358          | 29.725                           | 60                  | 58                  | 67                                | 10                 | 10                             | ST             | M4     | U            |                |        |                              | U           |                |        |                              | U            |                |        | 10 | 6  | 0.05                            |                      |                       |  |  |
| 0458          | 29.740                           | 59                  | 57                  | 60                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 0558          | 29.750                           | 59                  | 57                  | 60                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 0658          | 29.740                           | 59                  | 57                  | 60                                | 10                 | 10                             | ST             | E4     | U            |                |        |                              | U           |                |        |                              | U            |                |        | 10 | 2  | 0.35                            |                      |                       |  |  |
| 0758          | 29.710                           | 60                  | 58                  | 70                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 0858          | 29.715                           | 61                  | 59                  | 87                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 0958          | 29.780                           | 62                  | 59                  | 84                                | 10                 | 10                             | ST             | B6     | U            |                |        |                              | U           |                |        |                              | U            |                |        | 10 | 2  | 0.20                            |                      |                       |  |  |
| 1058          | 29.780                           | 64                  | 60                  | 78                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 1158          | 29.775                           | 65                  | 60                  | 75                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 1258          | 29.760                           | 66                  | 60                  | 70                                | 10                 | 10                             | ST             | EL     | U            |                |        |                              | U           |                |        |                              | U            |                |        | 10 | 8  | 0.20                            |                      |                       |  |  |
| 1358          | 29.735                           | 66                  | 59                  | 68                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 1458          | 29.720                           | 64                  | 59                  | 75                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 1558          | 29.710                           | 64                  | 59                  | 73                                | 10                 | 0                              | H              | -      | 10           | ST             | B7     | 10                           | 4           |                |        |                              | U            |                |        | 10 | 7  | 0.50                            |                      |                       |  |  |
| 1658          | 29.710                           | 62                  | 58                  | 78                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 1758          | 29.710                           | 61                  | 57                  | 81                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 1858          | 29.705                           | 60                  | 57                  | 84                                | 10                 | 10                             | ST             | B7     | 0            |                |        |                              | 10          | 0              |        |                              | 10           | 0              |        | 9  | 9  | 0.05                            |                      |                       |  |  |
| 1958          | 29.715                           | 60                  | 58                  | 87                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 2058          | 29.750                           | 60                  | 58                  | 87                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 2158          | 29.750                           | 59                  | 57                  | 90                                | 10                 | 10                             | ST             | M5     | U            |                |        |                              | U           |                |        |                              | U            |                |        | 10 | 1  | 0.25                            |                      |                       |  |  |
| 2258          | 29.735                           | 59                  | 58                  | 93                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |
| 2358          | 29.735                           | 59                  | 58                  | 93                                | 10                 |                                |                |        |              |                |        |                              |             |                |        |                              |              |                |        | 10 |    |                                 |                      |                       |  |  |

## SYNOPTIC OBSERVATIONS

| STATION PRESSURE COMPUTATIONS |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             |                |        |        |        |        |
|-------------------------------|------------|-----|--------------|----------------|-----------------|-----------------|-----------------|----------------|-----------|-----------------|--------------|----------------------------|-------------|----------------|--------|--------|--------|--------|
| TIME (UCT)                    | TIME (LST) | NO. | PRECIP. (In) | SNOW FALL (In) | SNOW DEPTH (In) | MAX. TEMP. (°F) | MIN. TEMP. (°F) | STATE OF CLOUD | SEA STATE | SWELL MGT. DIR. | SWELL PERIOD | SURF H <sub>2</sub> O DIR. | WATER TEMP. |                |        |        |        |        |
| 41                            | 42         | 43  | 44           | 45             | 46              | 47              | 48              | 49             | 50        | 51              | 52           | 53                         | 54          | 55             | 56     | 57     | 58     |        |
|                               | MID TO     | X   | 0            | 0              | X               | 60              | 60              | X              |           |                 |              |                            |             |                |        |        |        |        |
|                               | 0352       | 1   | 0            | 0              | 0               | 62              | 60              | 0              |           |                 |              |                            |             |                |        |        |        |        |
|                               | 0752       | 2   | 0            | 0              | 0               | 62              | 59              | 0              |           |                 |              |                            |             |                |        |        |        |        |
|                               | 1532       | 3   | 0            | 0              | 0               | 66              | 62              | 0              |           |                 |              |                            |             |                |        |        |        |        |
|                               | 2153       | 4   | 0            | 0              | 0               | 64              | 59              | 0              |           |                 |              |                            |             |                |        |        |        |        |
|                               | MID        | X   | 0            | 0              | 0               | 59              | 59              | X              |           |                 |              |                            |             |                |        |        |        |        |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | TIME (LST) 59  | 0355   | 0755   | 1535   | 2155   |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | ATT. THERM. 60 |        |        |        |        |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | OBSERV. BAR 61 | 1006.6 | 1022.4 | 1006.0 | 1006.3 |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | TOTAL CORR. 62 | 0      | 0      | 0      | 0      |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | STA. PRESS. 63 | 1006.6 | 1022.4 | 1006.0 | 1006.3 |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | BAROGRAPH 64   | 1006.2 | 1022.6 | 1006.0 | 1006.3 |
|                               |            |     |              |                |                 |                 |                 |                |           |                 |              |                            |             | BAR. CORR. 65  | +0.4   | -0.2   | -0.2   | 0      |

## SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| PEAK GUSTS             |                        |                     |                          |                      |                 |       |                   |               |               | SKY COVER           |                          | PRECIP. AND THUNDER. | BEGAN | ENDED | OBSTR. TO VISION | BEGAN | ENDED |
|------------------------|------------------------|---------------------|--------------------------|----------------------|-----------------|-------|-------------------|---------------|---------------|---------------------|--------------------------|----------------------|-------|-------|------------------|-------|-------|
| 24-HR. MAX. TEMP. (°F) | 24-HR. MIN. TEMP. (°F) | 24-HR. PRECIP. (In) | 24-HR. WATER EQUIV. (In) | 24-HR. SNOWFALL (In) | SNOW DEPTH (In) | SPEED | DI. REC. (L.S.T.) | TIME (L.S.T.) | TIME (L.S.T.) | SUN. RISE TO SUNSET | MID. NIGHT TO MID. NIGHT |                      |       |       |                  |       |       |
| 66                     | 59                     | 0                   | 0                        | 0                    | 0               | 12    | 145P              |               |               | 10                  | 10                       |                      |       |       | H                | CONT. | 1330  |

REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

| FASTEST RECORDED ONE MINUTE WIND SPEED | ASSOCIATED DIRECTION | TIME |
|--|----------------------|------|
| KMG'S                                  |                      |      |

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

\* Tower not observed

OPNAV FORM 3100-0 (REV. 8-61)

VSAS FORM 100

 DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

STATION

NAVSUB SAN CLEMENTE ISLAND

DATE

26 JULY 1971

| Type | Time<br>(LST) | Sky and ceiling<br>(Hundreds of Feet) | visibility<br>(Statute Miles) |       | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(Hgs.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind              |                | Air<br>sea<br>surface<br>temp.<br>(°F) | Remarks and supplemental coded data | Observer's<br>signature |
|------|---------------|---------------------------------------|-------------------------------|-------|---|----------------------------------|---------------|--------------------|-------------------|----------------|--|-------------------------------------|-------------------------|
|      |               |                                       | Surface                       | Tower |   |                                  |               |                    | Direction<br>(°T) | Speed<br>(Kts) |  |                                     |                         |
| (1)  | (2)           | (3)                                   | (4)                           | (5)   | (6)   | (7)                              | (8)           | (9)                | (10)              | (11)           | (12)                                   | (13)                                | (14)                    |
| R    | 0059          | E60                                   | 5                             |       | H   | 129                              | 60            | 56                 | 25                | 06             | 991                                    | 803 16//                            | OK                      |
| R    | 0158          | E60                                   | 5                             |       | H   | 126                              | 60            | 56                 | 27                | 07             | 991                                    |                                     | OK                      |
| R    | 0258          | E60                                   | 5                             |       | H   | 126                              | 60            | 56                 | 26                | 06             | 991                                    |                                     | OK                      |
| RS   | 0358          | H40                                   | 4                             |       | H   | 126                              | 60            | 56                 | 30                | 05             | 991                                    | 602 16// 60                         | OK                      |
| R    | 0458          | E40                                   | 4                             |       | H   | 132                              | 60            | 56                 | 29                | 04             | 992                                    |                                     | OK                      |
| R    | 0558          | E40                                   | 3                             | *     | H   | 136                              | 60            | 56                 | 28                | 05             | 993                                    |                                     | OK                      |
| R    | 0658          | E40                                   | 3                             | 3     | H   | 138                              | 59            | 56                 | 30                | 04             | 993                                    | 212 16//                            | OK                      |
| RS   | 0758          | E50                                   | 3                             | 3     | H   | 142                              | 60            | 57                 | 27                | 06             | 993                                    |                                     | OK                      |
| R    | 0858          | E50                                   | 3                             | 3     | H   | 143                              | 61            | 57                 | 31                | 04             | 996                                    |                                     | OK                      |
| R    | 0958          | B60                                   | 3                             | 7     | H   | 146                              | 62            | 57                 | 29                | 06             | 996                                    | 207 16// 59                         | OK                      |
| R    | 1058          | E60                                   | 3                             | 3     | H   | 146                              | 64            | 57                 | 31                | 06             | 996                                    |                                     | OK                      |
| R    | 1158          | E60                                   | 4                             |       | H   | 143                              | 65            | 57                 | 27                | 04             | 996                                    |                                     | OK                      |
| R    | 1258          | E60                                   | 4                             |       | H   | 138                              | 66            | 56                 | 26                | 06             | 994                                    | 807 16//                            | OK                      |
| R    | 1358          | A80                                   | 4                             |       | H   | 130                              | 66            | 55                 | 27                | 08             | 992                                    | 20                                  | OK                      |
| R    | 1458          | E60                                   | 4                             |       | H   | 124                              | 64            | 56                 | 30                | 12             | 990                                    |                                     | OK                      |
| R    | 1558          | B70                                   | 7                             |       |   | 121                              | 64            | 55                 | 31                | 02             | 989                                    | H ALQDS 717 16// 16                 | OK                      |
| R    | 1658          | E70                                   | 7                             |       |   | 121                              | 62            | 55                 | 29                | 06             | 989                                    | H ALQDS                             | OK                      |
| R    | 1758          | E70                                   | 7                             |       |   | 121                              | 61            | 55                 | 29                | 06             | 989                                    |                                     | OK                      |
| R    | 1858          | A70                                   | 7                             |       |   | 119                              | 60            | 55                 | 28                | 09             | 989                                    | SINQUE. OVHD 802 1600               | OK                      |
| R    | 1958          | E70                                   | 7                             |       |   | 123                              | 60            | 56                 | 28                | 06             | 990                                    |                                     | OK                      |
| R    | 2058          | E70                                   | 7                             |       |   | 128                              | 60            | 56                 | 27                | 08             | 991                                    |                                     | OK                      |
| R    | 2158          | A50                                   | 7                             |       |   | 128                              | 59            | 56                 | 27                | 08             | 991                                    | 108 16// 16                         | OK                      |
| R    | 2258          | E50                                   | 7                             |       |   | 130                              | 59            | 57                 | 27                | 06             | 992                                    |                                     | OK                      |
| R    | 2358          | E50                                   | 7                             |       |   | 130                              | 59            | 57                 | 29                | 10             | 992                                    |                                     | OK                      |

A synoptic observation, in WMO code format PW10, is entered on line following related aviation observation.

OP 0087

STATION **NWSED SAN CLEMENTE ISLAND**

DATE **25 JULY 1971**

DATE \_\_\_\_\_

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | TOTAL<br>SKY<br>COVER | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |             |                |        | TOTAL<br>OPAQUE<br>SKY<br>COVER | PRESSURE<br>TENDENCY | NET<br>3-HR<br>CHANGE |    |    |                              |              |    |    |
|---------------|----------------------------------|---------------------|---------------------|-----------------------------------|-----------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|-------------|----------------|--------|---------------------------------|----------------------|-----------------------|----|----|------------------------------|--------------|----|----|
|               |                                  |                     |                     |                                   |                       | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | SUM-<br>MA-<br>TION<br>TOTAL | THIRD LAYER |                |        |                                 |                      |                       |    |    | SUM-<br>MA-<br>TION<br>TOTAL | FOURTH LAYER |    |    |
|               |                                  |                     |                     |                                   |                       | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |                              | AMT.        | TYPE &<br>DIR. | HEIGHT | AMT.                            | TYPE &<br>DIR.       |                       |    |    |                              | HEIGHT       |    |    |
| 16            | 17                               | 18                  | 19                  | 20                                | 21                    | 22                             | 23             | 24     | 25           | 26             | 27     | 28                           | 29          | 30             | 31     | 32                              | 33                   | 34                    | 35 | 36 | 37                           | 38           | 39 | 40 |
| 0058          | 29.710                           | 52                  | 59                  | 84                                | 10                    | 10                             | SC             | 66     | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 8                            | .125         |    |    |
| 0158          | 29.720                           | 61                  | 59                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 0258          | 29.720                           | 61                  | 59                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 0358          | 29.720                           | 61                  | 59                  | 87                                | 10                    | 10                             | SC             | E6     | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 1                            | .010         |    |    |
| 0458          | 29.725                           | 61                  | 59                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 0558          | 29.725                           | 61                  | 59                  | 87                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 0658          | 29.740                           | 61                  | 59                  | 90                                | 10                    | 10                             | ST             | E6     | U            |                |        |                              | U           |                |        |                                 | U                    |                       |    | 10 | 2                            | .020         |    |    |
| 0758          | 29.740                           | 61                  | 59                  | 90                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 0858          | 29.740                           | 63                  | 61                  | 81                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 0958          | 29.745                           | 64                  | 60                  | 81                                | 10                    | 10                             | ST             | E6     | U            |                |        |                              | U           |                |        |                                 | U                    |                       |    | 10 | 3                            | .005         |    |    |
| 1058          | 29.750                           | 65                  | 61                  | 78                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 1158          | 29.745                           | 68                  | 62                  | 70                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 1258          | 29.740                           | 67                  | 61                  | 70                                | 10                    | 10                             | ST             | E7     | U            |                |        |                              | U           |                |        |                                 | U                    |                       |    | 10 | 8                            | .105         |    |    |
| 1358          | 29.725                           | 67                  | 60                  | 68                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 1458          | 29.720                           | 68                  | 61                  | 65                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 1558          | 29.710                           | 67                  | 60                  | 68                                | 10                    | 10                             | SC             | E11    | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 7                            | .030         |    |    |
| 1658          | 29.710                           | 66                  | 60                  | 70                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 1758          | 29.710                           | 65                  | 60                  | 73                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 1858          | 29.710                           | 65                  | 60                  | 73                                | 10                    | 10                             | SC             | E11    | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 5                            | .000         |    |    |
| 1958          | 29.720                           | 63                  | 59                  | 81                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 2058          | 29.740                           | 62                  | 59                  | 81                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 2158          | 29.740                           | 62                  | 59                  | 84                                | 10                    | 10                             | SC             | E11    | 4            |                |        |                              | 4           |                |        |                                 | 4                    |                       |    | 10 | 1                            | .030         |    |    |
| 2258          | 29.740                           | 62                  | 58                  | 81                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |
| 2358          | 29.740                           | 60                  | 58                  | 81                                | 10                    |                                |                |        |              |                |        |                              |             |                |        |                                 |                      |                       |    | 10 |                              |              |    |    |

SYNOPTIC OBSERVATIONS

| TIME<br>(GCT) | TIME<br>(LST) | NO. | PRECIP.<br>(In) | SNOW<br>FALL<br>(In) | SNOW<br>DEPTH<br>(In) | MAX.<br>TEMP.<br>(°F) | MIN.<br>TEMP.<br>(°F) | STATE<br>OF<br>SKY | SEA<br>STATE | SWELL<br>DIR. | SWELL<br>PERIOD | SURF<br>TEMP.<br>°F | WATER<br>TEMP.<br>°F | STATION PRESSURE COMPUTATIONS |        |        |        |
|---------------|---------------|-----|-----------------|----------------------|-----------------------|-----------------------|-----------------------|--------------------|--------------|---------------|-----------------|---------------------|----------------------|-------------------------------|--------|--------|--------|
| 0058          | 0058          | 1   | 0               | 0                    | 0                     | 62                    | 61                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | TIME (LST)                    | 0352   | 0955   | 1555   |
| 0158          | 0158          | 2   | 0               | 0                    | 0                     | 63                    | 61                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | ATT. THERM.                   |        |        |        |
| 0258          | 0258          | 3   | 0               | 0                    | 0                     | 64                    | 61                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | OBSERV. BAR.                  | 1355.4 | 1007.3 | 1006.1 |
| 0358          | 0358          | 4   | 0               | 0                    | 0                     | 68                    | 64                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | TOTAL CORR.                   | 0      | 0      | 0      |
| 0458          | 0458          | 5   | 0               | 0                    | 0                     | 67                    | 62                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | STA. PRESS.                   | 1355.4 | 1007.3 | 1006.1 |
| 0558          | 0558          | 6   | 0               | 0                    | 0                     | 67                    | 62                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | BAROGRAPH                     | 1355.4 | 1006.6 | 1006.2 |
| 0658          | 0658          | 7   | 0               | 0                    | 0                     | 62                    | 60                    | 0                  | 0            | 0             | 0               | 0                   | 0                    | BAR. CORR.                    | +1.4   | +0.7   | +0.2   |

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

| 24-HR.<br>MAX.<br>TEMP.<br>(°F) | 24-HR.<br>MIN.<br>TEMP.<br>(°F) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(In.) | 24-HR.<br>SNOWFALL<br>UNMELT.<br>(In.) | SNOW<br>DEPTH<br>(In.) | PEAK GUSTS | SKY COVER | PRECIP.<br>AND<br>THUNDER. | BEGAN | ENDED | OBSTR.<br>TO<br>VISION | BEGAN | ENDED |
|---------------------------------|---------------------------------|---|--|------------------------|------------|-----------|----------------------------|-------|-------|------------------------|-------|-------|
| 68                              | 60                              | 0   | 0                                      | 0                      | 71         | 10        | 0                          | 0     | 0     | 0                      | 0     | 0     |
| 68                              | 60                              | 0   | 0                                      | 0                      | 71         | 10        | 0                          | 0     | 0     | 0                      | 0     | 0     |

| FASTEST RECORDED ONE MINUTE WIND SPEED | ASSOCIATED DIRECTION | TIME |
|--|----------------------|------|
| 71                                     | 08                   | 1558 |

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

\* TOWER 1117, 1130

## SURFACE WEATHER OBSERVATIONS

3-16 November 1971

OPNAV FORM 3140-7 (4-65)  
0107-711-1001

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

WBAN 10B

STATION NWUSD SAN CLEMENTE DATE 03 November 1971

| TIME<br>(LST) | STATION<br>PRES.<br>(Inch) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMIDITY<br>(%) | WIND<br>DIR. | CLOUDS AND OBSCURING PHENOMENA |              |             |                     |        |                |      |        |                |      |        |                | TOTAL<br>OPAQUE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE | REMARKS |
|---------------|----------------------------|---------------------|---------------------|-------------------------|--------------|--------------------------------|--------------|-------------|---------------------|--------|----------------|------|--------|----------------|------|--------|----------------|---------------------------------|-----------------------|---------|
|               |                            |                     |                     |                         |              | LOWEST LAYER                   | SECOND LAYER | THIRD LAYER | SUM-<br>MA-<br>TION | HEIGHT | TYPE &<br>DIR. | AMT. | HEIGHT | TYPE &<br>DIR. | AMT. | HEIGHT | TYPE &<br>DIR. | AMT.                            |                       |         |
|               |                            |                     |                     |                         |              | ANT. DIR.                      | ANT. DIR.    | ANT. DIR.   | TOTAL               |        |                |      |        |                |      |        |                |                                 |                       |         |
| 18            | 17                         |                     | 18                  | 20                      | 21           | 22                             | 23           | 24          | 25                  | 26     | 27             | 28   | 29     | 30             | 31   | 32     | 33             | 34                              | 35                    |         |
| 0051          | 29.940                     | 53                  | 52                  | 73                      | 5            | 5                              | -X           | -           | 0                   |        |                | 5    | 0      |                |      |        |                |                                 | 5                     | 8.025   |
| 0151          | 29.925                     | 49                  | 48                  | 72                      | 0            |                                |              |             |                     |        |                |      |        |                |      |        |                | 0                               |                       |         |
| 0251          | 29.910                     | 56                  | 53                  | 80                      | 0            |                                |              |             |                     |        |                |      |        |                |      |        |                | 0                               |                       |         |
| 0351          | 29.895                     | 54                  | 52                  | 86                      | 0            |                                |              |             |                     |        |                | 0    | 0      |                |      |        |                | 0                               |                       |         |
| 0451          | 29.880                     | 56                  | 54                  | 86                      | 0            |                                |              |             |                     |        |                |      |        |                |      |        |                | 0                               |                       |         |
| 0551          | 29.865                     | 58                  | 54                  | 86                      | 0            |                                |              |             |                     |        |                |      |        |                |      |        |                | 0                               |                       |         |
| 0651          | 29.850                     | 53                  | 51                  | 89                      | 0            | 0                              | 01           | 250         | 0                   |        |                | 0    | 0      |                |      |        |                | 0                               |                       | 1.020   |
| 0751          | 29.835                     | 62                  | 60                  | 87                      | 0            |                                |              |             |                     |        |                |      |        |                |      |        |                | 0                               |                       |         |
| 0851          | 29.820                     | 64                  | 59                  | 75                      | 0            |                                |              |             |                     |        |                |      |        |                |      |        |                | 0                               |                       |         |
| 0951          | 29.805                     | 65                  | 58                  | 68                      | 2            | 2                              | 01           | 250         | 0                   |        |                | 2    | 0      |                |      |        |                | 1                               |                       | 1.015   |
| 1051          | 29.790                     | 70                  | 62                  | 66                      | 1            |                                |              |             |                     |        |                |      |        |                |      |        |                | 1                               |                       |         |
| 1151          | 29.775                     | 72                  | 57                  | 59                      | 1            |                                |              |             |                     |        |                |      |        |                |      |        |                | 1                               |                       |         |
| 1251          | 29.760                     | 74                  | 57                  | 32                      | 3            | 3                              | 01           | 250         | 0                   |        |                | 3    | 0      |                |      |        |                | 2                               |                       | 2.065   |
| 1351          | 29.745                     | 72                  | 58                  | 43                      | 3            |                                |              |             |                     |        |                |      |        |                |      |        |                | 1                               |                       |         |
| 1451          | 29.730                     | 71                  | 55                  | 32                      | 3            |                                |              |             |                     |        |                |      |        |                |      |        |                | 2                               |                       |         |
| 1551          | 29.715                     | 71                  | 54                  | 29                      | 3            | 3                              | 01           | 250         | 0                   |        |                | 3    | 0      |                |      |        |                | 2                               |                       | 2.025   |
| 1651          | 29.700                     | 68                  | 52                  | 36                      | 2            |                                |              |             |                     |        |                |      |        |                |      |        |                | 2                               |                       |         |
| 1751          | 29.685                     | 63                  | 51                  | 41                      | 2            |                                |              |             |                     |        |                |      |        |                |      |        |                | 2                               |                       |         |
| 1851          | 29.670                     | 62                  | 53                  | 56                      | 2            | 2                              | 01           | 250         | 0                   |        |                | 2    | 0      |                |      |        |                | 2                               |                       | 2.015   |
| 1951          | 29.655                     | 60                  | 54                  | 67                      | 4            |                                |              |             |                     |        |                |      |        |                |      |        |                | 2                               |                       |         |
| 2051          | 29.640                     | 61                  | 53                  | 60                      | 5            |                                |              |             |                     |        |                |      |        |                |      |        |                | 2                               |                       |         |
| 2151          | 29.625                     | 63                  | 62                  | 44                      | 5            | 5                              | 01           | 250         | 0                   |        |                | 5    | 0      |                |      |        |                | 2                               |                       | 2.010   |
| 2251          | 29.610                     | 60                  | 53                  | 62                      | 3            |                                |              |             |                     |        |                |      |        |                |      |        |                | 1                               |                       |         |
| 2351          | 29.595                     | 60                  | 50                  | 47                      | 2            |                                |              |             |                     |        |                |      |        |                |      |        |                | 1                               |                       |         |

SYNOPTIC OBSERVATIONS

OPNAV FORM 3100-6 (REV. 8-61)

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |            |                                    |                            |       |                                    |                           |            |              |           |             |                           |                |                |                    | STATION<br>NAME<br>03 November 1971 |                | REMARKS AND SUPPLEMENTAL CODED DATA |  | REMARKS AND SUPPLEMENTAL CODED DATA |  |
|---|------------|------------------------------------|----------------------------|-------|------------------------------------|---------------------------|------------|--------------|-----------|-------------|---------------------------|----------------|----------------|--------------------|-------------------------------------|----------------|-------------------------------------|--|-------------------------------------|--|
| Type  | Time (ZST) | Sky and ceiling (Hundreds of Feet) | Visibility (Statute Miles) |       | Weather and obstructions to vision | Sea level pressure (Hpa.) | Temp. (°F) | Dew pt. (°F) | Direction | Speed (Kts) | Wind                      | Air temp. (°F) | Sea temp. (°F) | Wave height (Feet) | Wave period (Secs)                  | Wave direction | Wave state                          |  |                                     |  |
|   |            |                                    | Surface                    | Temp. |                                    |                           |            |              |           |             |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| U   | 0000       | -X                                 | 0                          |       | GF                                 | 30.05                     | 51         | 19           | 04        | 012         | 808                       |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0100       | 0                                  | 5                          |       | H                                  | 30.17                     | 54         | 00           | 00        | 011         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0200       | 0                                  | 5                          |       | H                                  | 30.27                     | 50         | 00           | 00        | 009         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0300       | 0                                  | 5                          |       | H                                  | 30.31                     | 50         | 00           | 00        | 010         | 508                       | 49             |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0400       | 0                                  | 3                          |       | GF                                 | 30.36                     | 50         | 00           | 00        | 010         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0500       | 0                                  | 3                          |       | H                                  | 30.52                     | 50         | 00           | 00        | 011         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0600       | 0                                  | 10                         |       |                                    | 30.53                     | 50         | 19           | 02        | 012         | PSWT C' S / 107 1001      |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0700       | 0                                  | 10                         |       |                                    | 30.62                     | 58         | 00           | 00        | 013         | KH LVR SMOUGTS / FEW C1 S |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0800       | 0                                  | 15                         |       |                                    | 30.64                     | 55         | 22           | 03        | 013         | FEW C1 S                  |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 0900       | 250-0                              | 15                         |       |                                    | 30.65                     | 54         | 27           | 02        | 013         | 49                        |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1000       | 250-0                              | 15                         |       |                                    | 30.70                     | 58         | 29           | 02        | 01R         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1100       | 250-0                              | 15                         |       |                                    | 30.72                     | 46         | 36           | 05        | 009         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1200       | 250-0                              | 15                         |       |                                    | 30.74                     | 42         | 27           | 03        | 007         | WIND SHFT 722 1001        |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1300       | 250-0                              | 15                         |       |                                    | 30.72                     | 48         | 26           | 03        | 005         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1400       | 250-0                              | 25                         |       |                                    | 30.71                     | 40         | 27           | 04        | 005         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1500       | 250-0                              | 25                         |       |                                    | 30.71                     | 37         | 25           | 04        | 004         | 708 1001 74               |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1600       | 250-0                              | 25                         |       |                                    | 30.68                     | 40         | 22           | 04        | 004         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1700       | 250-0                              | 25                         |       |                                    | 30.63                     | 39         | 23           | 04        | 005         | WIND LGT VRBL             |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1800       | 250-0                              | 25                         |       |                                    | 30.62                     | 46         | 24           | 03        | 006         | WIND LGT VRBL 205         |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 1900       | 250-0                              | 25                         |       |                                    | 30.60                     | 49         | 00           | 00        | 006         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 2000       | 250-0                              | 25                         |       |                                    | 30.61                     | 47         | 26           | 03        | 005         | WIND LGT VRBL             |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 2100       | 250-0                              | 25                         |       |                                    | 30.63                     | 41         | 30           | 04        | 007         | WIND LGT VRBL 003 1001 74 |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 2200       | 250-0                              | 25                         |       |                                    | 30.60                     | 47         | 23           | 04        | 004         | WIND LGT VRBL             |                |                |                    |                                     |                |                                     |  |                                     |  |
| P   | 2300       | 250-0                              | 25                         |       |                                    | 30.60                     | 40         | 00           | 00        | 003         |                           |                |                |                    |                                     |                |                                     |  |                                     |  |

Don Observation

3 NOV

| STATION PRESSURE COMPUTATIONS |      |      |      |      |      |      |      |      |      |
|-------------------------------|------|------|------|------|------|------|------|------|------|
| TIME (LST)                    | 59   | 58   | 57   | 56   | 55   | 54   | 53   | 52   | 51   |
| TIME (LST)                    | 50   | 49   | 48   | 47   | 46   | 45   | 44   | 43   | 42   |
| 1215                          | 1214 | 1213 | 1212 | 1211 | 1210 | 1209 | 1208 | 1207 | 1206 |
| 1205                          | 1204 | 1203 | 1202 | 1201 | 1200 | 1159 | 1158 | 1157 | 1156 |
| 1155                          | 1154 | 1153 | 1152 | 1151 | 1150 | 1149 | 1148 | 1147 | 1146 |
| 1145                          | 1144 | 1143 | 1142 | 1141 | 1140 | 1139 | 1138 | 1137 | 1136 |
| 1135                          | 1134 | 1133 | 1132 | 1131 | 1130 | 1129 | 1128 | 1127 | 1126 |
| 1125                          | 1124 | 1123 | 1122 | 1121 | 1120 | 1119 | 1118 | 1117 | 1116 |
| 1115                          | 1114 | 1113 | 1112 | 1111 | 1110 | 1109 | 1108 | 1107 | 1106 |
| 1105                          | 1104 | 1103 | 1102 | 1101 | 1100 | 1099 | 1098 | 1097 | 1096 |
| 1095                          | 1094 | 1093 | 1092 | 1091 | 1090 | 1089 | 1088 | 1087 | 1086 |
| 1085                          | 1084 | 1083 | 1082 | 1081 | 1080 | 1079 | 1078 | 1077 | 1076 |
| 1075                          | 1074 | 1073 | 1072 | 1071 | 1070 | 1069 | 1068 | 1067 | 1066 |
| 1065                          | 1064 | 1063 | 1062 | 1061 | 1060 | 1059 | 1058 | 1057 | 1056 |
| 1055                          | 1054 | 1053 | 1052 | 1051 | 1050 | 1049 | 1048 | 1047 | 1046 |
| 1045                          | 1044 | 1043 | 1042 | 1041 | 1040 | 1039 | 1038 | 1037 | 1036 |
| 1035                          | 1034 | 1033 | 1032 | 1031 | 1030 | 1029 | 1028 | 1027 | 1026 |
| 1025                          | 1024 | 1023 | 1022 | 1021 | 1020 | 1019 | 1018 | 1017 | 1016 |
| 1015                          | 1014 | 1013 | 1012 | 1011 | 1010 | 1009 | 1008 | 1007 | 1006 |
| 1005                          | 1004 | 1003 | 1002 | 1001 | 1000 | 999  | 998  | 997  | 996  |
| 995                           | 994  | 993  | 992  | 991  | 990  | 989  | 988  | 987  | 986  |
| 985                           | 984  | 983  | 982  | 981  | 980  | 979  | 978  | 977  | 976  |
| 975                           | 974  | 973  | 972  | 971  | 970  | 969  | 968  | 967  | 966  |
| 965                           | 964  | 963  | 962  | 961  | 960  | 959  | 958  | 957  | 956  |
| 955                           | 954  | 953  | 952  | 951  | 950  | 949  | 948  | 947  | 946  |
| 945                           | 944  | 943  | 942  | 941  | 940  | 939  | 938  | 937  | 936  |
| 935                           | 934  | 933  | 932  | 931  | 930  | 929  | 928  | 927  | 926  |
| 925                           | 924  | 923  | 922  | 921  | 920  | 919  | 918  | 917  | 916  |
| 915                           | 914  | 913  | 912  | 911  | 910  | 909  | 908  | 907  | 906  |
| 905                           | 904  | 903  | 902  | 901  | 900  | 899  | 898  | 897  | 896  |
| 895                           | 894  | 893  | 892  | 891  | 890  | 889  | 888  | 887  | 886  |
| 885                           | 884  | 883  | 882  | 881  | 880  | 879  | 878  | 877  | 876  |
| 875                           | 874  | 873  | 872  | 871  | 870  | 869  | 868  | 867  | 866  |
| 865                           | 864  | 863  | 862  | 861  | 860  | 859  | 858  | 857  | 856  |
| 855                           | 854  | 853  | 852  | 851  | 850  | 849  | 848  | 847  | 846  |
| 845                           | 844  | 843  | 842  | 841  | 840  | 839  | 838  | 837  | 836  |
| 835                           | 834  | 833  | 832  | 831  | 830  | 829  | 828  | 827  | 826  |
| 825                           | 824  | 823  | 822  | 821  | 820  | 819  | 818  | 817  | 816  |
| 815                           | 814  | 813  | 812  | 811  | 810  | 809  | 808  | 807  | 806  |
| 805                           | 804  | 803  | 802  | 801  | 800  | 799  | 798  | 797  | 796  |
| 795                           | 794  | 793  | 792  | 791  | 790  | 789  | 788  | 787  | 786  |
| 785                           | 784  | 783  | 782  | 781  | 780  | 779  | 778  | 777  | 776  |
| 775                           | 774  | 773  | 772  | 771  | 770  | 769  | 768  | 767  | 766  |
| 765                           | 764  | 763  | 762  | 761  | 760  | 759  | 758  | 757  | 756  |
| 755                           | 754  | 753  | 752  | 751  | 750  | 749  | 748  | 747  | 746  |
| 745                           | 744  | 743  | 742  | 741  | 740  | 739  | 738  | 737  | 736  |
| 735                           | 734  | 733  | 732  | 731  | 730  | 729  | 728  | 727  | 726  |
| 725                           | 724  | 723  | 722  | 721  | 720  | 719  | 718  | 717  | 716  |
| 715                           | 714  | 713  | 712  | 711  | 710  | 709  | 708  | 707  | 706  |
| 705                           | 704  | 703  | 702  | 701  | 700  | 699  | 698  | 697  | 696  |
| 695                           | 694  | 693  | 692  | 691  | 690  | 689  | 688  | 687  | 686  |
| 685                           | 684  | 683  | 682  | 681  | 680  | 679  | 678  | 677  | 676  |
| 675                           | 674  | 673  | 672  | 671  | 670  | 669  | 668  | 667  | 666  |
| 665                           | 664  | 663  | 662  | 661  | 660  | 659  | 658  | 657  | 656  |
| 655                           | 654  | 653  | 652  | 651  | 650  | 649  | 648  | 647  | 646  |
| 645                           | 644  | 643  | 642  | 641  | 640  | 639  | 638  | 637  | 636  |
| 635                           | 634  | 633  | 632  | 631  | 630  | 629  | 628  | 627  | 626  |
| 625                           | 624  | 623  | 622  | 621  | 620  | 619  | 618  | 617  | 616  |
| 615                           | 614  | 613  | 612  | 611  | 610  | 609  | 608  | 607  | 606  |
| 605                           | 604  | 603  | 602  | 601  | 600  | 599  | 598  | 597  | 596  |
| 595                           | 594  | 593  | 592  | 591  | 590  | 589  | 588  | 587  | 586  |
| 585                           | 584  | 583  | 582  | 581  | 580  | 579  | 578  | 577  | 576  |
| 575                           | 574  | 573  | 572  | 571  | 570  | 569  | 568  | 567  | 566  |
| 565                           | 564  | 563  | 562  | 561  | 560  | 559  | 558  | 557  | 556  |
| 555                           | 554  | 553  | 552  | 551  | 550  | 549  | 548  | 547  | 546  |
| 545                           | 544  | 543  | 542  | 541  | 540  | 539  | 538  | 537  | 536  |
| 535                           | 534  | 533  | 532  | 531  | 530  | 529  | 528  | 527  | 526  |
| 525                           | 524  | 523  | 522  | 521  | 520  | 519  | 518  | 517  | 516  |
| 515                           | 514  | 513  | 512  | 511  | 510  | 509  | 508  | 507  | 506  |
| 505                           | 504  | 503  | 502  | 501  | 500  | 499  | 498  | 497  | 496  |
| 495                           | 494  | 493  | 492  | 491  | 490  | 489  | 488  | 487  | 486  |
| 485                           | 484  | 483  | 482  | 481  | 480  | 479  | 478  | 477  | 476  |
| 475                           | 474  | 473  | 472  | 471  | 470  | 469  | 468  | 467  | 466  |
| 465                           | 464  | 463  | 462  | 461  | 460  | 459  | 458  | 457  | 456  |
| 455                           | 454  | 453  | 452  | 451  | 450  | 449  | 448  | 447  | 446  |
| 445                           | 444  | 443  | 442  | 441  | 440  | 439  | 438  | 437  | 436  |
| 435                           | 434  | 433  | 432  | 431  | 430  | 429  | 428  | 427  | 426  |
| 425                           | 424  | 423  | 422  | 421  | 420  | 419  | 418  | 417  | 416  |
| 415                           | 414  | 413  | 412  | 411  | 410  | 409  | 408  | 407  | 406  |
| 405                           | 404  | 403  | 402  | 401  | 400  | 399  | 398  | 397  | 396  |
| 395                           | 394  | 393  | 392  | 391  | 390  | 389  | 388  | 387  | 386  |
| 385                           | 384  | 383  | 382  | 381  | 380  | 379  | 378  | 377  | 376  |
| 375                           | 374  | 373  | 372  | 371  | 370  | 369  | 368  | 367  | 366  |
| 365                           | 364  | 363  | 362  | 361  | 360  | 359  | 358  | 357  | 356  |
| 355                           | 354  | 353  | 352  | 351  | 350  | 349  | 348  | 347  | 346  |
| 345                           | 344  | 343  | 342  | 341  | 340  | 339  | 338  | 337  | 336  |
| 335                           | 334  | 333  | 332  | 331  | 330  | 329  | 328  | 327  | 326  |
| 325                           | 324  | 323  | 322  | 321  | 320  | 319  | 318  | 317  | 316  |
| 315                           | 314  | 313  | 312  | 311  | 310  | 309  | 308  | 307  | 306  |
| 305                           | 304  | 303  | 302  | 301  | 300  | 299  | 298  | 297  | 296  |
| 295                           | 294  | 293  | 292  | 291  | 290  | 289  | 288  | 287  | 286  |
| 285                           | 284  | 283  | 282  | 281  | 280  | 279  | 278  | 277  | 276  |
| 275                           | 274  | 273  | 272  | 271  | 270  | 269  | 268  | 267  | 266  |
| 265                           | 264  | 263  | 262  | 261  | 260  | 259  | 258  | 257  | 256  |
| 255                           | 254  | 253  | 252  | 251  | 250  | 249  | 248  | 247  | 246  |
| 245                           | 244  | 243  | 242  | 241  | 240  | 239  | 238  | 237  | 236  |
| 235                           | 234  | 233  | 232  | 231  | 230  | 229  | 228  | 227  | 226  |
| 225                           | 224  | 223  | 222  | 221  | 220  | 219  | 218  | 217  | 216  |
| 215                           | 214  | 213  | 212  | 211  | 210  | 209  | 208  | 207  | 206  |
| 205                           | 204  | 203  | 202  | 201  | 200  | 199  | 198  | 197  | 196  |
| 195                           | 194  | 193  | 192  | 191  | 190  | 189  | 188  | 187  | 186  |
| 185                           | 184  | 183  | 182  | 181  | 180  | 179  | 178  | 177  | 176  |
| 175                           | 174  | 173  | 172  | 171  | 170  | 169  | 168  | 167  | 166  |
| 165                           | 164  | 163  | 162  | 161  | 160  | 159  | 158  | 157  | 156  |
| 155                           | 154  | 153  | 152  | 151  | 150  | 149  | 148  | 147  | 146  |
| 145                           | 144  | 143  | 142  | 141  | 140  | 139  | 138  | 137  | 136  |
| 135                           | 134  | 133  | 132  | 131  | 130  | 129  | 128  | 127  | 126  |
| 125                           | 124  | 123  | 122  | 121  | 120  | 119  | 118  | 117  | 116  |
| 115                           | 114  | 113  | 112  | 111  | 110  | 109  | 108  | 107  | 106  |
| 105                           | 104  | 103  | 102  | 101  | 100  | 99   | 98   | 97   | 96   |
| 95                            | 94   | 93   | 92   | 91   | 90   | 89   | 88   | 87   | 86   |
| 85                            | 84   | 83   | 82   | 81   | 80   | 79   | 78   | 77   | 76   |
| 75                            | 74   | 73   | 72   | 71   | 70   | 69   | 68   | 67   | 66   |
| 65                            | 64   | 63   | 62   | 61   | 60   | 59   | 58   | 57   | 56   |
| 55                            | 54   | 53   | 52   | 51   | 50   | 49   | 48   | 47   | 46   |
| 45                            | 44   | 43   | 42   | 41   | 40   | 39   | 38   | 37   | 36   |
| 35                            | 34   | 33   | 32   | 31   | 30   | 29   | 28   | 27   | 26   |
| 25                            | 24   | 23   | 22   | 21   | 20   | 19   | 18   | 17   | 16   |
| 15                            | 14   | 13   | 12   | 11   | 10   | 9    | 8    | 7    | 6    |
| 5                             | 4    | 3    | 2    | 1    | 0    | 59   | 58   | 57   | 56   |

NOTE: There are no required entries in columns without headings.  
Any data needed locally may be entered.

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

WBAN 10B

STATION UNSED SAN CLEMENTE TEND DATE 04 NOVEMBER 1971

| TIME<br>(LST) | STATION<br>PRES.<br>(Inch) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMIDITY<br>(%) | REL.<br>WIND<br>SPEED<br>(KTS) | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |             |                |        |              |                |        | TOTAL<br>OPAQUE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE | WIND<br>DIRECTION<br>(°) | WIND<br>SPEED<br>(KTS) |      |                |        |
|---------------|----------------------------|---------------------|---------------------|-------------------------|--------------------------------|--------------------------------|----------------|--------|--------------|----------------|--------|-------------|----------------|--------|--------------|----------------|--------|---------------------------------|-----------------------|--------------------------|------------------------|------|----------------|--------|
|               |                            |                     |                     |                         |                                | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER |                |        | FOURTH LAYER |                |        |                                 |                       |                          |                        |      |                |        |
|               |                            |                     |                     |                         |                                | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.        | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |                                 |                       |                          |                        |      |                |        |
|               |                            |                     |                     |                         |                                |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       |                          |                        | AMT. | TYPE &<br>DIR. | HEIGHT |
| 16            | 17                         | 18                  | 19                  | 20                      | 21                             | 22                             | 23             | 24     | 25           | 26             | 27     | 28          | 29             | 30     | 31           | 32             | 33     | 34                              | 35                    | 36                       | 37                     | 38   | 39             | 40     |
| 0055          | 29.835                     | 63                  | 52                  | 46                      | 2                              | 2                              | C1             | 250    | 0            |                |        | 2           | 0              |        |              | 2              | 0      |                                 |                       | 1                        | 7                      |      |                |        |
| 0150          | 29.825                     | 60                  | 53                  | 64                      | 2                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 1                        |                        |      |                |        |
| 0250          | 29.820                     | 58                  | 52                  | 69                      | 2                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 1                        |                        |      |                |        |
| 0350          | 29.820                     | 56                  | 62                  | 74                      | 2                              | 2                              | C1             | 250    | 0            |                |        | 2           | 0              |        |              | 2              | 0      |                                 |                       | 1                        | 6                      |      |                |        |
| 0450          | 29.815                     | 52                  | 49                  | 83                      | 2                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 1                        |                        |      |                |        |
| 0550          | 29.815                     | 53                  | 50                  | 83                      | 4                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 3                        |                        |      |                |        |
| 0650          | 29.820                     | 58                  | 60                  | 90                      | 7                              | 7                              | C1             | 250    | 0            |                |        | 7           | 0              |        |              | 7              | 0      |                                 |                       | 3                        | 5                      |      |                |        |
| 0750          | 29.820                     | 65                  | 58                  | 68                      | 7                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 3                        |                        |      |                |        |
| 0850          | 29.825                     | 66                  | 58                  | 63                      | 7                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 5                        |                        |      |                |        |
| 0950          | 29.825                     | 67                  | 59                  | 61                      | 8                              | 8                              | C1             | 250    | 0            |                |        | 8           | 0              |        |              | 8              | 0      |                                 |                       | 6                        | 1                      |      |                |        |
| 1050          | 29.820                     | 67                  | 58                  | 53                      | 8                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 6                        |                        |      |                |        |
| 1150          | 29.805                     | 67                  | 58                  | 57                      | 8                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 6                        |                        |      |                |        |
| 1250          | 29.775                     | 68                  | 58                  | 54                      | 8                              | 8                              | C1             | 250    | 0            |                |        | 8           | 0              |        |              | 8              | 0      |                                 |                       | 7                        | 7                      |      |                |        |
| 1350          | 29.750                     | 68                  | 58                  | 53                      | 7                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 6                        |                        |      |                |        |
| 1450          | 29.745                     | 69                  | 55                  | 34                      | 8                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 5                        |                        |      |                |        |
| 1550          | 29.785                     | 64                  | 57                  | 63                      | 9                              | 9                              | C1             | 200    | 0            |                |        | 9           | 0              |        |              | 9              | 0      |                                 |                       | 3                        | 7                      |      |                |        |
| 1650          | 29.740                     | 60                  | 54                  | 67                      | 8                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 3                        |                        |      |                |        |
| 1750          | 29.745                     | 58                  | 54                  | 77                      | 5                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 3                        |                        |      |                |        |
| 1850          | 29.745                     | 58                  | 55                  | 80                      | 5                              | 2                              | AC             | 180    | 3            | C1             | 200    | 5           | 0              |        |              | 5              | 0      |                                 |                       | 2                        | 1                      |      |                |        |
| 1950          | 29.745                     | 56                  | 54                  | 86                      | 4                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 2                        |                        |      |                |        |
| 2050          | 29.750                     | 58                  | 56                  | 87                      | 3                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 1                        |                        |      |                |        |
| 2150          | 29.760                     | 57                  | 55                  | 86                      | 3                              | 2                              | AC             | 180    | 1            | C1             | 250    | 3           | 0              |        |              | 3              | 0      |                                 |                       | 1                        | 3                      |      |                |        |
| 2250          | 29.755                     | 56                  | 54                  | 90                      | 7                              |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 3                        |                        |      |                |        |
| 2350          | 29.745                     | 66                  | 54                  | 90                      | 10                             |                                |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 5                        |                        |      |                |        |

SYNOPTIC OBSERVATIONS

SYNOPTIC OBSERVATIONS

OPNAV FORM 3140-6 (REV. 8-61)

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |               |                                       |                               |              |   |                                |               |               |                          | STATION<br>UNWEED SAN CLEMENTE ISLAND |                          | DATE<br>04 NOVEMBER 1971            |                      | YEAR FROM 194          |                       |
|---|---------------|---------------------------------------|-------------------------------|--------------|---|--------------------------------|---------------|---------------|--------------------------|---------------------------------------|--------------------------|-------------------------------------|----------------------|------------------------|-----------------------|
| Type  | Time<br>(ZST) | Sky and ceiling<br>(Hundreds of Feet) | Visibility<br>(Statute Miles) |              | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(in) | Temp.<br>(°F) | Wind<br>(Kts) | Wave<br>height<br>(feet) | Air-sea<br>temp.<br>(°F)              | Air-sea<br>temp.<br>(°C) | Remarks and supplemental coded data | Wind<br>dir.<br>(°T) | Wind<br>speed<br>(Kts) | Wind<br>gust<br>(Kts) |
|   |               |                                       | Surface<br>(a)                | Upper<br>(b) |   |                                |               |               |                          |                                       |                          |                                     |                      |                        |                       |
| R   | 0058          | 250-0                                 | 2.5                           |              |   | 16.4                           | 65            | 42            | 30                       | 103                                   | 102                      | WUD LGT VERBL 710 1001              |                      |                        | 5K                    |
| R   | 0158          | 250-0                                 | 2.5                           |              |   | 16.1                           | 60            | 48            | 21                       | 102                                   | 101                      |                                     |                      |                        | 5K                    |
| R   | 0258          | 250-0                                 | 2.5                           |              |   | 15.9                           | 58            | 48            | 22                       | 102                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 0358          | 250-0                                 | 2.5                           |              |   | 15.9                           | 56            | 48            | 00                       | 100                                   | 100                      | 605 1001 56                         |                      |                        | 5K                    |
| R   | 0458          | 250-0                                 | 2.5                           |              |   | 15.8                           | 52            | 47            | 00                       | 100                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 0558          | 180-0 250-0                           | 2.5                           |              |   | 15.8                           | 52            | 48            | 17                       | 104                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 0658          | 250-0                                 | 2.5                           |              |   | 15.1                           | 59            | 55            | 19                       | 104                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 0758          | 250-0                                 | 1.5                           |              |   | 15.2                           | 65            | 54            | 00                       | 100                                   | 101                      | KH LVR SANDUNG IS 500 1001          |                      |                        | 5K                    |
| R   | 0858          | 250-0                                 | 1.5                           |              |   | 15.1                           | 66            | 52            | 22                       | 103                                   | 101                      |                                     |                      |                        | 5K                    |
| R   | 0958          | 250-0                                 | 1.5                           |              |   | 15.1                           | 67            | 52            | 27                       | 102                                   | 101                      | 102 1001 52                         |                      |                        | 5K                    |
| R   | 1058          | 250-0                                 | 1.5                           |              |   | 15.9                           | 67            | 51            | 30                       | 103                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 1158          | 250-0                                 | 1.5                           |              |   | 15.4                           | 67            | 52            | 36                       | 105                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 1258          | 250-0                                 | 1.5                           |              |   | 14.5                           | 68            | 51            | 35                       | 104                                   | 100                      | 717 1002                            |                      |                        | 5K                    |
| R   | 1358          | 250-0                                 | 1.5                           |              |   | 13.6                           | 68            | 50            | 25                       | 104                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 1458          | 250-0                                 | 1.5                           |              |   | 13.4                           | 69            | 43            | 20                       | 104                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 1558          | 250-0                                 | 1.5                           |              |   | 13.0                           | 64            | 51            | 24                       | 105                                   | 100                      | 714 1001 69                         |                      |                        | 5K                    |
| R   | 1658          | 250-0                                 | 1.5                           |              |   | 13.2                           | 60            | 49            | 24                       | 104                                   | 100                      | 22 SW-W                             |                      |                        | 5K                    |
| R   | 1758          | 250-0                                 | 2.5                           |              |   | 13.4                           | 58            | 51            | 21                       | 104                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 1858          | 250-0                                 | 2.5                           |              |   | 13.4                           | 58            | 52            | 23                       | 104                                   | 100                      |                                     |                      |                        | 5K                    |
| R   | 1958          | 250-0                                 | 2.5                           |              |   | 13.4                           | 56            | 52            | 24                       | 104                                   | 100                      | 103 1071                            |                      |                        | 5K                    |
| R   | 2058          | 250-0                                 | 10                            |              |   | 13.6                           | 58            | 54            | 20                       | 104                                   | 100                      | H ALQDS                             |                      |                        | 5K                    |
| R   | 2158          | 250-0                                 | 10                            |              |   | 13.8                           | 57            | 53            | 22                       | 104                                   | 100                      | H ALQDS 305 1071 69                 |                      |                        | 5K                    |
| R   | 2258          | 250-0                                 | 10                            |              |   | 13.7                           | 56            | 53            | 20                       | 105                                   | 100                      | H ALQDS                             |                      |                        | 5K                    |
| R   | 2358          | 250-0                                 | 4                             |              |   | 13.4                           | 56            | 53            | 21                       | 106                                   | 100                      | F INCRG                             |                      |                        | 5K                    |

Initial observation



OPNAV FORM 3140-7 (4-65)  
0107-711-1001

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

BBAN 10B

STATION NUWSED SAN CLEMENTE ISLAND DATE 5 NOVEMBER 1971

| TIME<br>(LST) |                | STATION<br>PRES.<br>(Zr) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMIDITY<br>(%) | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |             |                |        |              |                |        |                         |                |        |      | TOTAL<br>OPAQUE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE |    |
|---------------|----------------|--------------------------|---------------------|---------------------|-------------------------|--------------------------------|----------------|--------|--------------|----------------|--------|-------------|----------------|--------|--------------|----------------|--------|-------------------------|----------------|--------|------|---------------------------------|-----------------------|----|
|               |                |                          |                     |                     |                         | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER |                |        | FOURTH LAYER |                |        | SUM-<br>MATION<br>TOTAL |                |        |      |                                 |                       |    |
| AMT.          | TYPE &<br>DIR. | HEIGHT                   | AMT.                | TYPE &<br>DIR.      | HEIGHT                  | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.        | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.                    | TYPE &<br>DIR. | HEIGHT | AMT. | TYPE &<br>DIR.                  | HEIGHT                |    |
| 18            | 17             | 18                       | 19                  | 20                  | 21                      | 22                             | 23             | 24     | 25           | 26             | 27     | 28          | 29             | 30     | 31           | 32             | 33     | 34                      | 35             | 36     | 37   | 38                              | 39                    | 40 |
| 0048          | 29.735         | 56                       | 55                  | 93                  | 10                      | 10                             | ST             | 6      | 0            |                |        | 10          | 0              |        |              | 10             | 0      |                         |                | 5      | 7    | 1.025                           |                       |    |
| 0155          | 29.735         | 56                       | 55                  | 93                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 4      |      |                                 |                       |    |
| 0241          | 29.720         | 56                       | 55                  | 93                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 4      |      |                                 |                       |    |
| 0358          | 29.730         | 57                       | 56                  | 93                  | 10                      | 10                             | ST             | 14     | U            |                |        |             | U              |        |              |                |        |                         |                | 10     | 6    | 1.005                           |                       |    |
| 0458          | 29.730         | 56                       | 54                  | 90                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 10     |      |                                 |                       |    |
| 0558          | 29.720         | 56                       | 54                  | 90                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 10     |      |                                 |                       |    |
| 0658          | 29.735         | 55                       | 53                  | 90                  | 10                      | 10                             | ST             | 67     | 0            |                |        | 10          | 0              |        |              | 10             | 0      |                         |                | 12     | 3    | 1.005                           |                       |    |
| 0758          | 29.745         | 56                       | 54                  | 90                  | 7                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 5      |      |                                 |                       |    |
| 0858          | 29.755         | 56                       | 54                  | 86                  | 9                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 8      |      |                                 |                       |    |
| 0958          | 29.770         | 57                       | 54                  | 80                  | 9                       | 9                              | ST             | 7      | 0            |                |        | 9           | 0              |        |              | 9              | 0      |                         |                | 9      | 2    | 1.035                           |                       |    |
| 1058          | 29.750         | 58                       | 55                  | 80                  | 6                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 6      |      |                                 |                       |    |
| 1158          | 29.740         | 60                       | 55                  | 72                  | 8                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 8      |      |                                 |                       |    |
| 1258          | 29.710         | 59                       | 54                  | 72                  | 8                       | 1                              | ST             | 10     | 7            | AC             | 120    | 8           | 0              |        |              | 8              | 0      |                         |                | 8      | 7    | 1.060                           |                       |    |
| 1358          | 29.710         | 59                       | 54                  | 72                  | 8                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 8      |      |                                 |                       |    |
| 1458          | 29.705         | 59                       | 54                  | 72                  | 8                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 8      |      |                                 |                       |    |
| 1558          | 29.705         | 58                       | 53                  | 75                  | 10                      | 7                              | ST             | 10     | 10           | AC             | 150    | 10          | U              |        |              |                | U      |                         |                | 10     | 6    | 1.005                           |                       |    |
| 1658          | 29.710         | 57                       | 53                  | 75                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 10     |      |                                 |                       |    |
| 1758          | 29.725         | 57                       | 53                  | 77                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 10     |      |                                 |                       |    |
| 1858          | 29.725         | 57                       | 53                  | 77                  | 10                      | 10                             | ST             | 9      | U            |                |        | U           |                |        |              |                | U      |                         |                | 10     | 2    | 1.030                           |                       |    |
| 1958          | 29.750         | 56                       | 53                  | 80                  | 3                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 3      |      |                                 |                       |    |
| 2058          | 29.750         | 52                       | 50                  | 86                  | 4                       |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 4      |      |                                 |                       |    |
| 2158          | 29.760         | 56                       | 54                  | 86                  | 7                       | 7                              | ST             | 9      | 0            |                |        | 7           | 0              |        |              | 7              | 0      |                         |                | 6      | 2    | 1.025                           |                       |    |
| 2258          | 29.765         | 56                       | 53                  | 83                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 10     |      |                                 |                       |    |
| 2358          | 29.765         | 56                       | 53                  | 83                  | 10                      |                                |                |        |              |                |        |             |                |        |              |                |        |                         |                | 10     |      |                                 |                       |    |

SYNOPTIC OBSERVATIONS



101

NOTE: There are no required entries in columns without headings.  
 "Any data needed locally may be entered".

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND AND SHIP)

MBAN 10B

STATION NW5ED SAN CLEMENTE ISLAND DATE 6 NOVEMBER 1971

| TIME<br>(LST) | STATION<br>PRES-<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMID-<br>ITY<br>(%) | REL.<br>WIND<br>SPEED<br>(KTS) | CLOUDS AND OBSCURING PHENOMENA |                |              |                |                |                |                         |              |                |   |  |    | TOTAL<br>OPAQUE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE |
|---------------|--------------------------|---------------------|---------------------|------------------------------|--------------------------------|--------------------------------|----------------|--------------|----------------|----------------|----------------|-------------------------|--------------|----------------|---|--|----|---------------------------------|-----------------------|
|               |                          |                     |                     |                              |                                | LOWEST LAYER                   |                | SECOND LAYER |                | THIRD LAYER    |                | SUM-<br>MATION<br>TOTAL | FOURTH LAYER |                |   |  |    |                                 |                       |
|               |                          |                     |                     |                              |                                | AMT.                           | HEIGHT<br>DIR. | AMT.         | HEIGHT<br>DIR. | TYPE &<br>DIR. | HEIGHT<br>DIR. |                         | AMT.         | HEIGHT<br>DIR. |   |  |    |                                 |                       |
| 0000          | 29.765                   | 56                  | 53                  | 80                           | 10                             | 10                             | ST             | 10           | U              |                |                |                         |              |                | U |  | 10 | 1,005                           |                       |
| 0100          | 29.770                   | 55                  | 52                  | 80                           | 7                              |                                |                |              |                |                |                |                         |              |                |   |  | 6  |                                 |                       |
| 0200          | 29.770                   | 56                  | 53                  | 80                           | 7                              |                                |                |              |                |                |                |                         |              |                |   |  | 6  |                                 |                       |
| 0300          | 29.770                   | 56                  | 53                  | 80                           | 10                             | 10                             | ST             | 10           | U              |                |                |                         |              |                | U |  | 10 | 2,010                           |                       |
| 0400          | 29.790                   | 56                  | 53                  | 80                           | 10                             |                                |                |              |                |                |                |                         |              |                |   |  | 10 |                                 |                       |
| 0500          | 29.825                   | 55                  | 52                  | 80                           | 10                             |                                |                |              |                |                |                |                         |              |                |   |  | 10 |                                 |                       |
| 0600          | 29.805                   | 52                  | 50                  | 89                           | 0                              | 0                              |                |              |                |                |                |                         |              |                | 0 |  | 0  | 1,030                           |                       |
| 0700          | 29.840                   | 58                  | 55                  | 83                           | 1                              |                                |                |              |                |                |                |                         |              |                |   |  | 1  |                                 |                       |
| 0800          | 29.845                   | 60                  | 54                  | 69                           | 1                              |                                |                |              |                |                |                |                         |              |                |   |  | 1  |                                 |                       |
| 0900          | 29.850                   | 60                  | 53                  | 64                           | 5                              | 5                              | SC             | 10           | 0              |                |                |                         |              |                | 5 |  | 5  | 2,045                           |                       |
| 1000          | 29.845                   | 62                  | 54                  | 60                           | 1                              |                                |                |              |                |                |                |                         |              |                |   |  | 1  |                                 |                       |
| 1100          | 29.830                   | 63                  | 55                  | 58                           | 0                              |                                |                |              |                |                |                |                         |              |                |   |  | 0  |                                 |                       |
| 1200          | 29.820                   | 63                  | 55                  | 58                           | 1                              | 1                              | SC             | 10           | 0              |                |                |                         |              |                | 1 |  | 1  | 7,030                           |                       |
| 1300          | 29.810                   | 62                  | 54                  | 60                           | 0                              |                                |                |              |                |                |                |                         |              |                |   |  | 0  |                                 |                       |
| 1400          | 29.810                   | 61                  | 54                  | 62                           | 1                              |                                |                |              |                |                |                |                         |              |                |   |  | 1  |                                 |                       |
| 1500          | 29.810                   | 60                  | 53                  | 64                           | 6                              | 6                              | SC             | E150         |                |                |                |                         |              |                | 6 |  | 6  | 2,010                           |                       |
| 1600          | 29.810                   | 58                  | 52                  | 64                           | 6                              |                                |                |              |                |                |                |                         |              |                |   |  | 6  |                                 |                       |
| 1700          | 29.825                   | 56                  | 51                  | 72                           | 6                              |                                |                |              |                |                |                |                         |              |                |   |  | 6  |                                 |                       |
| 1800          | 29.850                   | 55                  | 50                  | 72                           | 6                              | 6                              | ST             | E150         |                |                |                |                         |              |                | 6 |  | 6  | 3,020                           |                       |
| 1900          | 29.850                   | 67                  | 59                  | 80                           | 1                              |                                |                |              |                |                |                |                         |              |                |   |  | 6  |                                 |                       |
| 2000          | 29.855                   | 56                  | 51                  | 60                           | 3                              |                                |                |              |                |                |                |                         |              |                |   |  | 1  |                                 |                       |
| 2100          | 29.870                   | 56                  | 54                  | 61                           | 6                              | 6                              | ST             | E150         |                |                |                |                         |              |                | 6 |  | 6  | 2,030                           |                       |
| 2200          | 29.865                   | 56                  | 53                  | 83                           | 2                              |                                |                |              |                |                |                |                         |              |                |   |  | 7  |                                 |                       |
| 2300          | 29.860                   | 56                  | 53                  | 80                           | 10                             |                                |                |              |                |                |                |                         |              |                |   |  | 10 |                                 |                       |

SYNOPTIC OBSERVATIONS

OPNAV FORM 3140-6 (REV. 8-81)

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |               |                                      |                               |       |   |                                 |               |                    |                     | STATION<br>DUWED SAU CLEMENTE ISLAND<br>DATE<br>6 NOVEMBER 1971 |                      | YEAR FORM 104        |                        |                                     |                              |
|---|---------------|--------------------------------------|-------------------------------|-------|---|---------------------------------|---------------|--------------------|---------------------|---|----------------------|----------------------|------------------------|-------------------------------------|------------------------------|
| Type  | Time<br>(ZST) | Sky and ceiling<br>(Becards of feet) | Visibility<br>(Statute Miles) |       | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(Hb.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Direction<br>(true) | Speed<br>(kts)  | Air<br>temp.<br>(°F) | Sea<br>temp.<br>(°F) | Wave<br>height<br>(ft) | Remarks and supplemental coded data | Obs.<br>Ver.<br>Fac.<br>Time |
|   |               |                                      | Surface                       | Upper |   |                                 |               |                    |                     |   |                      |                      |                        |                                     |                              |
| R   | 0350          | M12 ☉                                | 5                             |       | H   | 141                             | 56.50         | 50                 | 09                  | 102   | 995                  |                      |                        | 102 1611                            | BR                           |
| R   | 0450          | E12 ☉                                | 5                             |       | H   | 142                             | 55.49         | 49                 | 07                  | 102   | 995                  |                      |                        |                                     | BR                           |
| R   | 0550          | E12 ☉                                | 5                             |       | H   | 142                             | 56.50         | 50                 | 00                  | 100   | 995                  |                      |                        |                                     | BR                           |
| R   | 0650          | F12 ☉                                | 5                             |       | H   | 143                             | 56.50         | 50                 | 00                  | 100   | 995                  |                      |                        | 203 1611 52                         | BR                           |
| R   | 0750          | E12 ☉                                | 5                             |       | H   | 149                             | 56.50         | 50                 | 00                  | 100   | 997                  |                      |                        | 1000C QUNH                          | BR                           |
| R   | 0850          | E12 ☉                                | 5                             |       | H   | 154                             | 55.49         | 49                 | 00                  | 100   | 997                  |                      |                        | THN SPTS INJDK                      | BR                           |
| R   | 0950          | O                                    | 5                             |       | H   | 154                             | 58.49         | 49                 | 12                  | 02  | 997                  |                      |                        | DSNT ST W 110                       | BR                           |
| R   | 1050          | 10 ☉                                 | 5                             |       | H   | 166                             | 58.53         | 53                 | 00                  | 00  | 998                  |                      |                        |                                     | BR                           |
| R   | 1150          | 10 ☉                                 | 5                             |       | H   | 167                             | 60.50         | 50                 | 02                  | 03  | 998                  |                      |                        |                                     | BR                           |
| R   | 1250          | 10 ☉                                 | 5                             |       | H   | 169                             | 60.48         | 48                 | 05                  | 06  | 998                  |                      |                        | 215 1500 52                         | BR                           |
| R   | 1350          | 10 ☉                                 | 5                             |       | H   | 167                             | 62.48         | 48                 | 11                  | 05  | 998                  |                      |                        |                                     | BR                           |
| R   | 1450          | O                                    | 5                             |       | H   | 162                             | 63.48         | 48                 | 09                  | 08  | 998                  |                      |                        | 710 1500                            | BR                           |
| R   | 1550          | 10 ☉                                 | 5                             |       | H   | 159                             | 63.48         | 48                 | 24                  | 08  | 998                  |                      |                        |                                     | BR                           |
| R   | 1650          | O                                    | 5                             |       | H   | 156                             | 62.48         | 48                 | 25                  | 05  | 998                  |                      |                        |                                     | BR                           |
| R   | 1750          | 15 ☉                                 | 7                             |       |   | 158                             | 61.48         | 48                 | 27                  | 04  | 999                  |                      |                        | 603 1500 63                         | BR                           |
| R   | 1850          | E15 ☉                                | 7                             |       |   | 150                             | 60.58         | 58                 | 28                  | 06  | 999                  |                      |                        |                                     | BR                           |
| R   | 1950          | E15 ☉                                | 7                             |       |   | 156                             | 58.46         | 46                 | 29                  | 04  | 999                  |                      |                        |                                     | BR                           |
| R   | 2050          | E15 ☉                                | 7                             |       |   | 161                             | 56.47         | 47                 | 30                  | 02  | 999                  |                      |                        |                                     | BR                           |
| R   | 2150          | E15 ☉                                | 7                             |       |   | 162                             | 55.46         | 46                 | 00                  | 00  | 999                  |                      |                        | 310 1600                            | BR                           |
| R   | 2250          | E15 ☉                                | 7                             |       |   | 169                             | 57.51         | 51                 | 00                  | 00  | 999                  |                      |                        |                                     | BR                           |
| R   | 2350          | E15 ☉                                | 7                             |       |   | 171                             | 56.50         | 50                 | 00                  | 00  | 999                  |                      |                        | 210 1600 63                         | BR                           |
| R   | 2450          | E15 ☉                                | 7                             |       |   | 176                             | 56.52         | 52                 | 00                  | 00  | 999                  |                      |                        |                                     | BR                           |
| R   | 2550          | M11 ☉                                | 5                             |       | H   | 174                             | 56.51         | 51                 | 00                  | 00  | 999                  |                      |                        | THN SPTS INJDK                      | BR                           |

100 observation.

[illegible]

OPNAV FORM 3140-7 (4-65)  
0107-711-1001

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

WBAN 10B

STATION UNUSED SAN CLEMENTE ISLAND DATE 7 NOVEMBER 1971

| TIME<br>(LST) | STATION<br>PRES.<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMID-<br>ITY<br>(%) | SEA<br>STATE | CLOUDS AND OBSERVING PHENOMENA |        |              |        |             |        |              |        |                              |                |      |        |                              |                |      |        | TOTAL<br>OPAQUE<br>SKY<br>COVER | REF-<br>ER-<br>ENCE | NET<br>3-HR<br>CHANGE | 38 | 39 | 40 |
|---------------|----------------------------------|---------------------|---------------------|------------------------------|--------------|--------------------------------|--------|--------------|--------|-------------|--------|--------------|--------|------------------------------|----------------|------|--------|------------------------------|----------------|------|--------|---------------------------------|---------------------|-----------------------|----|----|----|
|               |                                  |                     |                     |                              |              | LOWEST LAYER                   |        | SECOND LAYER |        | THIRD LAYER |        | FOURTH LAYER |        | SIM-<br>MA-<br>TION<br>TOTAL | TYPE &<br>DIR. | AMT. | HEIGHT | SIM-<br>MA-<br>TION<br>TOTAL | TYPE &<br>DIR. | AMT. | HEIGHT |                                 |                     |                       |    |    |    |
|               |                                  |                     |                     |                              |              | AMT.                           | HEIGHT | AMT.         | HEIGHT | AMT.        | HEIGHT | AMT.         | HEIGHT |                              |                |      |        |                              |                |      |        |                                 |                     |                       |    |    |    |
| 16            | 17                               | 18                  | 19                  | 20                           | 21           | 22                             | 23     | 24           | 25     | 26          | 27     | 28           | 29     | 30                           | 31             | 32   | 33     | 34                           | 35             | 36   | 37     | 38                              | 39                  | 40                    |    |    |    |
| 0058          | 29.855                           | 56                  | 53                  | 80                           | 10           | 10                             | ST     | E 11         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 7      | 015                             |                     |                       |    |    |    |
| 0158          | 29.855                           | 55                  | 52                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 0258          | 29.850                           | 55                  | 52                  | 83                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 0358          | 29.845                           | 55                  | 52                  | 83                           | 10           | 10                             | ST     | F 11         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 7      | 005                             |                     |                       |    |    |    |
| 0458          | 29.840                           | 55                  | 52                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 0558          | 29.835                           | 55                  | 52                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 0658          | 29.870                           | 55                  | 52                  | 83                           | 10           | 10                             | ST     | E 11         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 8      | 020                             |                     |                       |    |    |    |
| 0758          | 29.910                           | 56                  | 53                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 0858          | 29.910                           | 56                  | 53                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 0958          | 29.910                           | 56                  | 53                  | 80                           | 10           | 10                             | ST     | E 11         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 1      | 040                             |                     |                       |    |    |    |
| 1058          | 29.905                           | 58                  | 52                  | 69                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 1158          | 29.890                           | 58                  | 52                  | 69                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 1258          | 29.870                           | 57                  | 51                  | 67                           | 10           | 10                             | ST     | E 15         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 7      | 040                             |                     |                       |    |    |    |
| 1358          | 29.850                           | 56                  | 51                  | 69                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 1458          | 29.845                           | 56                  | 51                  | 72                           | 9            |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 9    |        |                                 |                     |                       |    |    |    |
| 1558          | 29.845                           | 55                  | 50                  | 72                           | 10           | 10                             | ST     | E 15         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 6      | 025                             |                     |                       |    |    |    |
| 1658          | 29.850                           | 53                  | 51                  | 74                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 1758          | 29.850                           | 55                  | 52                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 1858          | 29.850                           | 55                  | 52                  | 80                           | 10           | 10                             | ST     | M 10         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 1      | 005                             |                     |                       |    |    |    |
| 1958          | 29.865                           | 55                  | 52                  | 83                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 2058          | 29.870                           | 55                  | 52                  | 80                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 2158          | 29.875                           | 55                  | 52                  | 83                           | 10           | 10                             | ST     | M 10         | U      |             |        |              |        |                              |                |      |        |                              |                | 10   | 1      | 025                             |                     |                       |    |    |    |
| 2258          | 29.870                           | 55                  | 52                  | 83                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |
| 2358          | 29.860                           | 54                  | 51                  | 83                           | 10           |                                |        |              |        |             |        |              |        |                              |                |      |        |                              |                | 10   |        |                                 |                     |                       |    |    |    |

SYNOPTIC ABBREVIATIONS

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |               |                                       |                               |       |   |                                  |               |                    |                      | STATION<br>UNUSO SAN CLEMENTE ISLAND |                                     | DATE<br>7 NOVEMBER 1971         |  |
|---|---------------|---------------------------------------|-------------------------------|-------|---|----------------------------------|---------------|--------------------|----------------------|--------------------------------------|-------------------------------------|---------------------------------|--|
| Type  | Time<br>(LST) | Sky and ceiling<br>(Hundreds of feet) | Visibility<br>(Statute Miles) |       | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(Hgs.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind<br>dir.<br>(°T) | Wind<br>speed<br>(Kts.)              | Remarks and supplemental coded data | Obs.<br>ver-<br>ified<br>(1/10) |  |
|   |               |                                       | Surface                       | Lower |   |                                  |               |                    |                      |                                      |                                     |                                 |  |
| R   | 0052          | E 110                                 | 5                             |       | H   | 171                              | 56            | 50                 | 34                   | 04                                   | 705 1611                            | BK                              |  |
| R   | 0155          | E 110                                 | 5                             |       | H   | 171                              | 55            | 49                 | 30                   | 03                                   | BINQUE QUHD                         | BK                              |  |
| R   | 0255          | F 110                                 | 5                             |       | H   | 169                              | 55            | 50                 | 30                   | 05                                   |                                     | BK                              |  |
| R   | 0358          | F 110                                 | 5                             |       | H   | 169                              | 53            | 50                 | 33                   | 05                                   | 702 1611 55                         | BK                              |  |
| R   | 0458          | F 110                                 | 5                             |       | H   | 172                              | 55            | 49                 | 31                   | 04                                   |                                     | BK                              |  |
| R   | 0558          | E 110                                 | 5                             |       | H   | 174                              | 55            | 49                 | 00                   | 00                                   |                                     | BK                              |  |
| R   | 0658          | F 110                                 | 5                             |       | H   | 176                              | 55            | 50                 | 36                   | 02                                   | 207 1611                            | LA                              |  |
| R   | 0758          | E 110                                 | 5                             |       | H   | 189                              | 56            | 50                 | 28                   | 02                                   |                                     | LA                              |  |
| R   | 0858          | F 110                                 | 3                             |       | H   | 189                              | 56            | 50                 | 26                   | 04                                   |                                     | LA                              |  |
| R   | 0958          | E 110                                 | 3                             |       | H   | 189                              | 56            | 50                 | 27                   | 03                                   | 114 1611 55                         | LA                              |  |
| R   | 1058          | B 150                                 | 3                             |       | H   | 188                              | 58            | 48                 | 23                   | 05                                   |                                     | LA                              |  |
| R   | 1158          | E 150                                 | 3                             |       | H   | 182                              | 58            | 48                 | 23                   | 03                                   |                                     | LA                              |  |
| R   | 1258          | E 150                                 | 5                             |       | H   | 176                              | 57            | 46                 | 27                   | 06                                   | 714 1611                            | LA                              |  |
| R   | 1358          | E 150                                 | 5                             |       | H   | 169                              | 56            | 46                 | 29                   | 06                                   |                                     | LA                              |  |
| R   | 1458          | E 150                                 | 5                             |       | H   | 167                              | 56            | 47                 | 29                   | 04                                   |                                     | LA                              |  |
| R   | 1558          | E 150                                 | 5                             |       | H   | 167                              | 55            | 46                 | 27                   | 06                                   | 608 1611 58                         | LA                              |  |
| R   | 1658          | E 150                                 | 5                             |       | H   | 169                              | 53            | 47                 | 28                   | 04                                   |                                     | LA                              |  |
| R   | 1758          | E 150                                 | 5                             |       | H   | 169                              | 55            | 49                 | 29                   | 05                                   |                                     | BK                              |  |
| R   | 1858          | M 100                                 | 5                             |       | H   | 169                              | 55            | 49                 | 25                   | 02                                   | 102 1611                            | BK                              |  |
| R   | 1958          | F 100                                 | 5                             |       | H   | 174                              | 55            | 50                 | 30                   | 05                                   | WNO LGT URGL                        | BK                              |  |
| R   | 2058          | F 100                                 | 5                             |       | H   | 176                              | 55            | 49                 | 32                   | 02                                   |                                     | BK                              |  |
| R   | 2158          | M 100                                 | 5                             |       | H   | 177                              | 55            | 50                 | 27                   | 04                                   | WNO LGT URGL 1611 58                | BK                              |  |
| R   | 2258          | E 100                                 | 5                             |       | H   | 176                              | 55            | 50                 | 29                   | 03                                   | WNO LGT URGL                        | BK                              |  |
| R   | 2358          | E 100                                 | 5                             |       | H   | 172                              | 54            | 49                 | 31                   | 02                                   |                                     | BK                              |  |

action observation.

107

NOTE: There are no required entries in columns without headings.  
 \*Any data needed locally may be entered\*.

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

WBAN 108

STATION UNUSED SAN CLEMENTE ISLAND DATE 8 NOVEMBER 1971

| CLOUDS AND OBSCURING PHENOMENA |                          |                     |                     |                         |              |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       |    |     |     |    |    |
|--------------------------------|--------------------------|---------------------|---------------------|-------------------------|--------------|--------------|----------------|--------|--------------|----------------|--------|-------------|----------------|--------|--------------|----------------|--------|---------------------------------|-----------------------|----|-----|-----|----|----|
| TIME<br>(LST)                  | STATION<br>PRES.<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMIDITY<br>(%) | WIND<br>DIR. | SECOND LAYER |                |        |              |                |        |             |                |        |              |                |        | TOTAL<br>OPAQUE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE |    |     |     |    |    |
|                                |                          |                     |                     |                         |              | LOWEST LAYER |                |        | SECOND LAYER |                |        | THIRD LAYER |                |        | FOURTH LAYER |                |        |                                 |                       |    |     |     |    |    |
|                                |                          |                     |                     |                         |              | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.        | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |                                 |                       |    |     |     |    |    |
| 16                             | 17                       | 18                  | 19                  | 20                      | 21           | 22           | 23             | 24     | 25           | 26             | 27     | 28          | 29             | 30     | 31           | 32             | 33     | 34                              | 35                    | 36 | 37  | 38  | 39 | 40 |
| 0058                           | 29.860                   | 54                  | 51                  | 83                      | 10           | 10           | ST             | E10    | 0            |                |        |             | U              |        |              |                | U      |                                 |                       | 10 | 6   | PI5 |    |    |
| 0158                           | 29.865                   | 55                  | 52                  | 83                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 0258                           | 29.855                   | 54                  | 51                  | 83                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 0358                           | 29.865                   | 54                  | 51                  | 80                      | 10           | 10           | ST             | M9     | U            |                |        |             | U              |        |              |                | U      |                                 |                       | 10 | 6   | PI5 |    |    |
| 0458                           | 29.855                   | 54                  | 51                  | 83                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 0558                           | 29.860                   | 54                  | 50                  | 77                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 0658                           | 29.875                   | 54                  | 51                  | 80                      | 10           | 10           | ST             | E11    | U            |                |        |             | U              |        |              |                | U      |                                 |                       | 10 | 3   | 020 |    |    |
| 0758                           | 29.890                   | 54                  | 51                  | 80                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 0858                           | 29.895                   | 57                  | 52                  | 72                      | 9            |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 9  |     |     |    |    |
| 0958                           | 29.905                   | 58                  | 53                  | 72                      | 9            | 2            | ST             | 11     | 7            | CI             | 250    | 9           | 0              |        |              |                | 9      | 0                               |                       | 4  | 1   | 030 |    |    |
| 1058                           | 29.895                   | 59                  | 53                  | 67                      | 7            |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 3  |     |     |    |    |
| 1158                           | 29.875                   | 60                  | 53                  | 64                      | 9            |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 6  |     |     |    |    |
| 1258                           | 29.850                   | 59                  | 52                  | 64                      | 10           | 1            | ST             | 11     | 7            | AC             | E180   | 8           | 2              | CS     | 250          | 10             |        |                                 | 7                     | 7  | 055 |     |    |    |
| 1358                           | 29.890                   | 59                  | 52                  | 62                      | 8            |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 6  |     |     |    |    |
| 1458                           | 29.845                   | 57                  | 51                  | 67                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 8  |     |     |    |    |
| 1558                           | 29.845                   | 57                  | 51                  | 67                      | 10           | 2            | ST             | 30     | 5            | AC             | E180   | 7           | 3              | CS     | 250          | 10             |        |                                 | 8                     | 6  | 005 |     |    |    |
| 1658                           | 29.845                   | 56                  | 51                  | 72                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 1758                           | 29.860                   | 56                  | 53                  | 90                      | 8            |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 8  |     |     |    |    |
| 1858                           | 29.870                   | 56                  | 53                  | 53                      | 9            | 2            | SC             | 30     | 4            | AC             | E180   | 6           | 3              | CS     | 250          | 9              |        |                                 | 9                     | 3  | 025 |     |    |    |
| 1958                           | 29.872                   | 56                  | 53                  | 53                      | 12           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 2058                           | 29.925                   | 56                  | 53                  | 83                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 2158                           | 29.875                   | 56                  | 53                  | 83                      | 10           | 6            | SC             | E30    | 4            | AC             | E180   | 10          | 4              |        |              |                |        |                                 | 10                    | 1  | 005 |     |    |    |
| 2258                           | 29.872                   | 56                  | 54                  | 96                      | 10           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 10 |     |     |    |    |
| 2358                           | 29.860                   | 55                  | 53                  | 85                      | 41           |              |                |        |              |                |        |             |                |        |              |                |        |                                 |                       | 41 |     |     |    |    |

SYNOPTIC OBSERVATIONS

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

BRAN 108

STATION UNUSED SAN CLEMENTE ISLAND DATE 8 NOVEMBER 1971

| CLOUDS AND OBSCURING PHENOMENA |                                  |                     |                     |                              |                      |                                |                |        |              |                |        |               |      |                |              |               |      |                                       |                       |
|--------------------------------|----------------------------------|---------------------|---------------------|------------------------------|----------------------|--------------------------------|----------------|--------|--------------|----------------|--------|---------------|------|----------------|--------------|---------------|------|---------------------------------------|-----------------------|
| TIME<br>(LST)                  | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMID-<br>ITY<br>(%) | REL.<br>WIND<br>DIR. | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |               |      |                |              |               |      | TOTAL<br>OPACI-<br>TY<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE |
|                                |                                  |                     |                     |                              |                      | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER   |      |                | FOURTH LAYER |               |      |                                       |                       |
|                                |                                  |                     |                     |                              |                      | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | TION<br>TOTAL | AMT. | TYPE &<br>DIR. | HEIGHT       | TION<br>TOTAL | AMT. |                                       |                       |
| 16                             | 17                               | 18                  | 19                  | 20                           | 21                   | 22                             | 23             | 24     | 25           | 26             | 27     | 28            | 29   | 30             | 31           | 32            | 33   | 34                                    | 35                    |
| 0050                           | 29.850                           | 54                  | 51                  | 83                           | 10                   | 10                             | ST             | E10    | U            |                |        |               | U    |                |              |               | U    |                                       | 10                    |
| 0150                           | 29.860                           | 55                  | 52                  | 83                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 0250                           | 29.855                           | 54                  | 51                  | 83                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 0350                           | 29.855                           | 54                  | 51                  | 80                           | 10                   | 10                             | ST             | M9     | U            |                |        |               | U    |                |              |               | U    |                                       | 10                    |
| 0450                           | 29.855                           | 54                  | 51                  | 83                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 0550                           | 29.860                           | 54                  | 50                  | 77                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 0650                           | 29.875                           | 54                  | 51                  | 80                           | 10                   | 10                             | ST             | E11    | U            |                |        |               | U    |                |              |               | U    |                                       | 10                    |
| 0750                           | 29.870                           | 54                  | 51                  | 80                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 0850                           | 29.895                           | 57                  | 52                  | 72                           | 9                    |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 9                     |
| 0950                           | 29.905                           | 58                  | 53                  | 72                           | 9                    | 2                              | ST             | 11     | 7            | CI             | 250    | 9             | 0    |                |              | 9             | 0    |                                       | 4                     |
| 1050                           | 29.895                           | 59                  | 53                  | 67                           | 7                    |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 3                     |
| 1150                           | 29.875                           | 60                  | 53                  | 64                           | 9                    |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 6                     |
| 1250                           | 29.850                           | 59                  | 52                  | 64                           | 10                   | 1                              | ST             | 11     | 7            | AC             | E180   | 8             | 2    | CS             | 250          | 10            |      | 7                                     | 7                     |
| 1350                           | 29.840                           | 59                  | 52                  | 62                           | 8                    |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 6                     |
| 1450                           | 29.845                           | 57                  | 51                  | 67                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 8                     |
| 1550                           | 29.845                           | 57                  | 51                  | 67                           | 10                   | 2                              | ST             | 30     | 5            | AC             | E180   | 7             | 3    | CS             | 250          | 10            |      | 8                                     | 8                     |
| 1650                           | 29.845                           | 56                  | 51                  | 72                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 1750                           | 29.860                           | 56                  | 53                  | 80                           | 8                    |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 8                     |
| 1850                           | 29.870                           | 56                  | 53                  | 53                           | 9                    | 2                              | SC             | 30     | 4            | AC             | E180   | 6             | 3    | CS             | 250          | 9             |      | 9                                     | 9                     |
| 1950                           | 29.870                           | 56                  | 53                  | 53                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 2050                           | 29.875                           | 56                  | 53                  | 83                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 2150                           | 29.875                           | 56                  | 53                  | 83                           | 10                   | 6                              | SC             | E30    | 4            | AC             | 180    | 10            | 4    |                |              |               | 4    |                                       | 10                    |
| 2250                           | 29.870                           | 56                  | 54                  | 96                           | 10                   |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 10                    |
| 2350                           | 29.860                           | 55                  | 53                  | 86                           | 4                    |                                |                |        |              |                |        |               |      |                |              |               |      |                                       | 4                     |

SYNOPTIC OBSERVATIONS





| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |               |                                       |                               |              |   |                                    |               |                      |                             | STATION<br>UNWEED SAN CLEMENTE ISLAND<br>DATE<br>9 NOVEMBER 1971 |                        | Remarks and supplemental coded data |                             | Observed<br>sea<br>state<br>(1-4) |  |
|---|---------------|---------------------------------------|-------------------------------|--------------|---|------------------------------------|---------------|----------------------|-----------------------------|--|------------------------|-------------------------------------|-----------------------------|-----------------------------------|--|
| Type  | Time<br>(LST) | Sky and ceiling<br>(Hundreds of feet) | Visibility<br>(Statute Miles) |              | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>pressure<br>(Hpa.) | Temp.<br>(°F) | Dew<br>point<br>(°F) | Wind<br>direction<br>(true) | Wind<br>speed<br>(kts)   | Wave<br>height<br>(ft) | Wave<br>period<br>(sec)             | Wave<br>direction<br>(true) | Wave<br>state<br>(1-4)            |  |
|   |               |                                       | Surface<br>(a)                | Tower<br>(b) |   |                                    |               |                      |                             |  |                        |                                     |                             |                                   |  |
| R   | 0058          | 1100                                  | 5                             |              | 17  | 102                                | 55            | 52                   | 33                          | 103  | 007                    |                                     |                             | AS                                |  |
| R   | 0158          | 1800                                  | 5                             |              | H   | 181                                | 55            | 52                   | 32                          | 104  | 007                    |                                     |                             | AS                                |  |
| R   | 0258          | 1800                                  | 5                             |              | H   | 176                                | 54            | 51                   | 04                          | 02   | 007                    |                                     |                             | AS                                |  |
| R   | 0358          | 1400                                  | 5                             |              | H   | 174                                | 53            | 50                   | 00                          | 00   | 007                    |                                     |                             | AS                                |  |
| R   | 0458          | -X 3000 F 1800                        | 2                             | *            | GF  | 181                                | 52            | 51                   | 00                          | 00   | 007                    |                                     |                             | AS                                |  |
| R   | 0558          | -X 3000 F 1800                        | 2                             | *            | GF  | 181                                | 52            | 51                   | 00                          | 00   | 007                    |                                     |                             | AS                                |  |
| R   | 0658          | -X 3000 F 1800                        | 2                             | 2            | GF  | 182                                | 54            | 54                   | 00                          | 00   | 007                    |                                     |                             | AS                                |  |
| R   | 0758          | -X 3000 F 1800                        | 1 1/2                         | 1 1/2        | GF  | 181                                | 54            | 55                   | 00                          | 00   | 007                    |                                     |                             | AS                                |  |
| R   | 0858          | -X 1500 F 1800                        | 1 1/2                         | 1 1/2        | GF  | 184                                | 54            | 54                   | 00                          | 00   | 007                    |                                     |                             | AS                                |  |
| R   | 0958          | -X 1500 F 1800                        | 1 1/2                         | 1 1/2        | GF  | 180                                | 54            | 53                   | 03                          | 06   | 007                    |                                     |                             | AS                                |  |
| R   | 1058          | -X 1500 F 1800                        | 2                             | 2            | H   | 184                                | 62            | 52                   | 34                          | 07   | 007                    |                                     |                             | AS                                |  |
| R   | 1158          | -X 1600 F 1800                        | 2 1/2                         | 2 1/2        | H   | 189                                | 62            | 52                   | 36                          | 04   | 007                    |                                     |                             | AS                                |  |
| R   | 1258          | -X 1600 F 1800                        | 2 1/2                         | 3            | H   | 181                                | 63            | 51                   | 34                          | 02   | 007                    |                                     |                             | AS                                |  |
| R   | 1337          | -X 1500 F 1800                        | 3                             | 3            | H   |                                    |               |                      | 30                          | 06   | 007                    |                                     |                             | AS                                |  |
| R   | 1356          | -X 1500 F 1800                        | 4                             | 3            | H   | 181                                | 61            | 50                   | 27                          | 06   | 007                    |                                     |                             | AS                                |  |
| R   | 1458          | 1500 F 1800                           | 10                            |              |   | 177                                | 54            | 49                   | 26                          | 06   | 007                    |                                     |                             | AS                                |  |
| R   | 1558          | 1000 F 1800                           | 10                            |              |   | 177                                | 54            | 49                   | 24                          | 07   | 007                    |                                     |                             | AS                                |  |
| R   | 1658          | 1000 F 1800                           | 10                            |              |   | 179                                | 57            | 49                   | 23                          | 06   | 006                    |                                     |                             | AS                                |  |
| R   | 1758          | 1000 F 1800                           | 7                             |              |   | 182                                | 56            | 51                   | 26                          | 06   | 007                    |                                     |                             | AS                                |  |
| R   | 1858          | 1000 F 1800                           | 7                             |              |   | 188                                | 56            | 51                   | 30                          | 07   | 007                    |                                     |                             | AS                                |  |
| R   | 1958          | 1000 F 1800                           | 7                             |              |   | 193                                | 56            | 51                   | 31                          | 04   | 010                    |                                     |                             | AS                                |  |
| R   | 2058          | 1000 F 1800                           | 7                             |              |   | 198                                | 56            | 51                   | 32                          | 06   | 012                    |                                     |                             | AS                                |  |
| R   | 2158          | 1000 F 1800                           | 7                             |              |   | 203                                | 54            | 51                   | 29                          | 05   | 013                    |                                     |                             | AS                                |  |
| R   | 2258          | 1000                                  | 7                             |              |   | 205                                | 56            | 51                   | 31                          | 03   | 014                    |                                     |                             | AS                                |  |
| R   | 2358          | 1000                                  | 7                             |              |   | 205                                | 56            | 50                   | 32                          | 04   | 014                    |                                     |                             | AS                                |  |

Observed observation.

**SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)**

✕ TOWER NOT MAILED

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

BBAN 10B

STATION NAVVED SAN CLEMENTE IS. DATE 10 MAY 1971

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | SEA-<br>WIND<br>SPEED<br>(Kts) | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                              |      |                |              |      |                | TOTAL<br>OPAKE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE | AD-<br>JUSTED<br>PRESSURE | TIME<br>ZONE |        |      |                |        |
|---------------|----------------------------------|---------------------|---------------------|-----------------------------------|--------------------------------|--------------------------------|----------------|--------|--------------|----------------|--------|------------------------------|------|----------------|--------------|------|----------------|--------------------------------|-----------------------|---------------------------|--------------|--------|------|----------------|--------|
|               |                                  |                     |                     |                                   |                                | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER                  |      |                | FOURTH LAYER |      |                |                                |                       |                           |              |        |      |                |        |
|               |                                  |                     |                     |                                   |                                | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | SUM-<br>MA-<br>TION<br>TOTAL | AMT. | TYPE &<br>DIR. | HEIGHT       | AMT. | TYPE &<br>DIR. |                                |                       |                           |              | HEIGHT | AMT. | TYPE &<br>DIR. | HEIGHT |
| 16            | 17                               | 18                  | 19                  | 20                                | 21                             | 22                             | 23             | 24     | 25           | 26             | 27     | 28                           | 29   | 30             | 31           | 32   | 33             | 34                             | 35                    | 36                        | 37           | 38     | 39   | 40             |        |
| 0058          | 29.945                           | 55                  | 53                  | 86                                | 4                              | 4                              | SC             | 10     | 0            |                |        | 4                            | 0    |                |              | 4    | 0              |                                |                       | 4                         | 0            | .005   |      |                |        |
| 0108          | 29.930                           | 55                  | 57                  | 86                                | 5                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 5                         |              |        |      |                |        |
| 0208          | 29.925                           | 55                  | 53                  | 86                                | 5                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 5                         |              |        |      |                |        |
| 0308          | 29.915                           | 55                  | 52                  | 80                                | 4                              | 4                              | SC             | 10     | 0            |                |        | 4                            | 0    |                |              | 4    | 0              |                                |                       | 4                         | 0            | .020   |      |                |        |
| 0408          | 29.915                           | 55                  | 51                  | 77                                | 2                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 2                         |              |        |      |                |        |
| 0508          | 29.930                           | 55                  | 52                  | 83                                | 9                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 9                         |              |        |      |                |        |
| 0608          | 29.950                           | 56                  | 53                  | 80                                | 8                              | 6                              | SC             | 10     | 2            | CS             | 250    | 8                            | 0    |                |              | 8    | 0              |                                |                       | 7                         | 3            | .035   |      |                |        |
| 0708          | 29.955                           | 59                  | 55                  | 78                                | 8                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 7                         |              |        |      |                |        |
| 0808          | 29.965                           | 60                  | 55                  | 72                                | 8                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 7                         |              |        |      |                |        |
| 0908          | 29.970                           | 61                  | 58                  | 70                                | 7                              | 4                              | SC             | 10     | 3            | CS             | 250    | 7                            | 0    |                |              | 7    | 0              |                                |                       | 5                         | 1            | .020   |      |                |        |
| 1008          | 29.950                           | 62                  | 55                  | 65                                | 9                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 7                         |              |        |      |                |        |
| 1108          | 29.930                           | 62                  | 55                  | 65                                | 8                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 6                         |              |        |      |                |        |
| 1208          | 29.920                           | 60                  | 54                  | 69                                | 9                              | 7                              | SC             | 811    | 2            | CS             | 250    | 9                            | 0    |                |              | 9    | 0              |                                |                       | 8                         | 7            | .050   |      |                |        |
| 1308          | 29.900                           | 61                  | 54                  | 65                                | 9                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 8                         |              |        |      |                |        |
| 1408          | 29.885                           | 61                  | 54                  | 65                                | 9                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 8                         |              |        |      |                |        |
| 1508          | 29.880                           | 59                  | 53                  | 69                                | 9                              | 1                              | SC             | 11     | 8            | CS             | 250    | 9                            | 0    |                |              | 9    | 0              |                                |                       | 7                         | 7            | .040   |      |                |        |
| 1608          | 29.860                           | 58                  | 58                  | 75                                | 9                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 4                         |              |        |      |                |        |
| 1708          | 29.825                           | 57                  | 54                  | 80                                | 2                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 2                         |              |        |      |                |        |
| 1808          | 29.900                           | 57                  | 54                  | 80                                | 2                              | 2                              | AS             | 180    | 0            |                |        | 2                            | 0    |                |              | 2    | 0              |                                |                       | 2                         | 3            | .020   |      |                |        |
| 1908          | 29.905                           | 57                  | 54                  | 83                                | 2                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 2                         |              |        |      |                |        |
| 2008          | 29.910                           | 57                  | 54                  | 83                                | 2                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 2                         |              |        |      |                |        |
| 2108          | 29.905                           | 56                  | 54                  | 86                                | 0                              | 0                              |                |        | 0            |                |        | 0                            | 0    |                |              | 0    | 0              |                                |                       | 0                         | 0            | .005   |      |                |        |
| 2208          | 29.900                           | 56                  | 54                  | 90                                | 8                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 8                         |              |        |      |                |        |
| 2308          | 29.900                           | 56                  | 55                  | 93                                | 2                              |                                |                |        |              |                |        |                              |      |                |              |      |                |                                |                       | 2                         |              |        |      |                |        |

UNCLASSIFIED

OPNAV FORM 3140-6 (REV. 8-61)

HEAD FORM 104

 DEPARTMENT OF THE NAVY  
 SURFACE WEATHER OBSERVATIONS  
 (LAND STATIONS)

 STATION  
 ANVISED SAN CLEMENTE IS.  
 DATE  
 10 NOVEMBER 1971

| Time<br>(22) | Sky and ceiling<br>(Hundreds of Feet) | Visibility<br>(Statute Miles) |       | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(Hgs.) | Temp.<br>(°F) | Wind<br>dir.<br>(°) | Wind<br>speed<br>(Kts) | Wind<br>gust<br>(Kts) | Air-sea<br>temp.<br>(°F) | Remarks and supplemental coded data | (121) | (122) | (123) | (124) | (125) |
|--------------|---------------------------------------|-------------------------------|-------|---|----------------------------------|---------------|---------------------|------------------------|-----------------------|--------------------------|-------------------------------------|-------|-------|-------|-------|-------|
|              |                                       | Surface                       | Lower |   |                                  |               |                     |                        |                       |                          |                                     |       |       |       |       |       |
| R 0050       | 100                                   | 7                             |       |   | 20.2                             | 55            | 31                  | 103                    |                       | 013                      | 802 1500                            |       |       |       |       | 00    |
| R 0150       | 100                                   | 7                             |       |   | 19.6                             | 55            | 31                  | 00                     | 00                    | 011                      |                                     |       |       |       |       | 00    |
| R 0250       | 100                                   | 7                             |       |   | 19.4                             | 55            | 31                  | 00                     | 00                    | 011                      |                                     |       |       |       |       | 00    |
| R 0350       | 100                                   | 7                             |       |   | 19.1                             | 55            | 49                  | 00                     | 100                   | 010                      | 710 1500 55                         |       |       |       |       | 00    |
| R 0450       | 100                                   | 7                             |       |   | 19.1                             | 55            | 48                  | 00                     | 100                   | 010                      |                                     |       |       |       |       | 00    |
| R 0550       | 100                                   | 7                             |       |   | 19.6                             | 55            | 50                  | 00                     | 100                   | 011                      |                                     |       |       |       |       | 00    |
| R 0650       | 100                                   | 10                            |       |   | 20.3                             | 56            | 50                  | 31                     | 102                   | 013                      | 312 1508                            |       |       |       |       | 00    |
| R 0750       | 100                                   | 15                            |       |   | 20.5                             | 57            | 52                  | 00                     | 00                    | 014                      |                                     |       |       |       |       | 00    |
| R 0850       | 100                                   | 15                            |       |   | 20.8                             | 60            | 51                  | 35                     | 04                    | 015                      |                                     |       |       |       |       | 00    |
| R 0950       | 100                                   | 15                            |       |   | 21.1                             | 61            | 51                  | 33                     | 04                    | 015                      | WIND LGT VRBL / 107 1508 55         |       |       |       |       | 00    |
| R 1050       | 100                                   | 15                            |       |   | 20.3                             | 62            | 50                  | 35                     | 05                    | 013                      | WIND LGT VRBL                       |       |       |       |       | 00    |
| R 1150       | 100                                   | 15                            |       |   | 19.6                             | 62            | 50                  | 30                     | 05                    | 011                      |                                     |       |       |       |       | 00    |
| R 1250       | 100                                   | 15                            |       |   | 19.3                             | 60            | 50                  | 31                     | 08                    | 010                      | 717 1508                            |       |       |       |       | 00    |
| R 1350       | 100                                   | 15                            |       |   | 18.6                             | 61            | 49                  | 30                     | 08                    | 008                      |                                     |       |       |       |       | 00    |
| R 1450       | 100                                   | 20                            |       |   | 18.1                             | 61            | 49                  | 30                     | 08                    | 007                      |                                     |       |       |       |       | 00    |
| R 1550       | 100                                   | 20                            |       |   | 17.9                             | 59            | 49                  | 29                     | 08                    | 006                      |                                     |       |       |       |       | 00    |
| R 1650       | 100                                   | 10                            |       |   | 17.9                             | 58            | 50                  | 31                     | 06                    | 006                      | 714 1508 63                         |       |       |       |       | 00    |
| R 1750       | 100                                   | 7                             |       |   | 18.4                             | 57            | 51                  | 30                     | 05                    | 008                      |                                     |       |       |       |       | 00    |
| R 1850       | 100                                   | 7                             |       |   | 18.6                             | 57            | 51                  | 31                     | 06                    | 008                      | 307 1010                            |       |       |       |       | 00    |
| R 1950       | 100                                   | 7                             |       |   | 18.1                             | 57            | 52                  | 31                     | 04                    | 009                      |                                     |       |       |       |       | 00    |
| R 2050       | 100                                   | 7                             |       |   | 18.9                             | 57            | 52                  | 30                     | 04                    | 009                      |                                     |       |       |       |       | 00    |
| R 2150       | 100                                   | 7                             |       |   | 18.8                             | 56            | 52                  | 31                     | 02                    | 009                      | 002 63                              |       |       |       |       | 00    |
| R 2250       | 100                                   | 7                             |       |   | 18.6                             | 56            | 53                  | 28                     | 02                    | 008                      |                                     |       |       |       |       | 00    |
| R 2350       | 100                                   | 7                             |       |   | 18.6                             | 56            | 52                  | 26                     | 03                    | 008                      |                                     |       |       |       |       | 00    |

Need Aviation observation.

31192f 1 2 31192

[illegible]

**SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)**

| SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)          |                                 |   |   |                          |            |      |           |    |                     |                  |                            |                    |    | PRECIP.<br>AND<br>THORSTIM. | BEGAN | ENDED | OBSER-<br>TO<br>VISION | BEGAN | ENDED |  |
|--|---------------------------------|---|---|--------------------------|------------|------|-----------|----|---------------------|------------------|----------------------------|--------------------|----|-----------------------------|-------|-------|------------------------|-------|-------|--|
| 24-HR.<br>MAX.<br>TEMP.<br>(F.)                | 24-HR.<br>MIN.<br>TEMP.<br>(F.) | 24-HR.<br>PRECIP.<br>WATER<br>EQUIV.<br>(Inch.) | 24-HR.<br>SNOW-FALL<br>UNMLTD.<br>(Inch.) | SNOW<br>DEPTH<br>(Inch.) | PEAK GUSTS |      | SKY COVER |    | DI-<br>REC-<br>TION | TIME<br>(L.S.T.) | SUM-<br>MID-<br>NIGHT<br>T | MID-<br>NIGHT<br>T |    |                             |       |       |                        |       |       |  |
| 66   | 67                              | 68  | 69  | 70                       | 71         | 72   | 73        | 74 |                     |                  |                            |                    | 75 | 76                          | 77    | 78    | 79                     | 80    | 81    |  |
| 63   | 55                              | 0   | 0   | 0                        | 1329       | 1335 |           |    |                     |                  |                            | 8                  | 6  |                             |       |       |                        |       |       |  |
| 90. REMARKS: NOTES AND MISCELLANEOUS PHENOMENA |                                 |   |   |                          |            |      |           |    |                     |                  |                            |                    |    |                             | Time  |       |                        |       |       |  |
| FASTEST RECORDED ONE MINUTE WIND SPEED         |                                 |   |   |                          |            |      |           |    |                     |                  |                            |                    |    |                             |       |       |                        |       |       |  |
| ASSOCIATED DIRECTION                           |                                 |   |   |                          |            |      |           |    |                     |                  |                            |                    |    |                             |       |       |                        |       |       |  |
| KNOTS  |                                 |   |   |                          |            |      |           |    |                     |                  |                            |                    |    |                             |       |       |                        |       |       |  |

**NOTE:** There are no required entries in columns without headings. "Any data needed locally may be entered".

OPNAV FORM 3140-7 (4-65)  
0107-711-1001

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

18AN 10B

STATION NWSED SAN CLEMENTE ISLAND DATE 11 NOVEMBER 1971

| TIME<br>(LST) | STATION<br>PRES.<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMID-<br>ITY (%) | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |             |                |        |                |                |        |              |                |        |    | TOTAL<br>OPAQUE<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE |    |    |
|---------------|--------------------------|---------------------|---------------------|---------------------------|--------------------------------|----------------|--------|--------------|----------------|--------|-------------|----------------|--------|----------------|----------------|--------|--------------|----------------|--------|----|---------------------------------|-----------------------|----|----|
|               |                          |                     |                     |                           | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER |                |        | SUM-<br>MATION |                |        | FOURTH LAYER |                |        |    |                                 |                       |    |    |
|               |                          |                     |                     |                           | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.        | TYPE &<br>DIR. | HEIGHT | AMT.           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |    |                                 |                       |    |    |
| 16            | 17                       | 18                  | 19                  | 20                        | 21                             | 22             | 23     | 24           | 25             | 26     | 27          | 28             | 29     | 30             | 31             | 32     | 33           | 34             | 35     | 36 | 37                              | 38                    | 39 | 40 |
| 0058          | 29.890                   | 56                  | 54                  | 90                        | 0                              | 0              |        |              | 0              |        |             | 0              | 0      |                |                | 0      | 0            |                |        | 0  | 7.015                           |                       |    |    |
| 0158          | 29.885                   | 56                  | 54                  | 86                        | 5                              |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 5  |                                 |                       |    |    |
| 0258          | 29.885                   | 55                  | 53                  | 90                        | 5                              |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 5  |                                 |                       |    |    |
| 0358          | 29.890                   | 57                  | 54                  | 86                        | 5                              | AS             | 120    | 0            |                |        |             | 5              | 0      |                |                |        |              |                |        | 5  | 5.000                           |                       |    |    |
| 0458          | 29.890                   | 56                  | 55                  | 93                        | 9                              |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 0558          | 29.885                   | 56                  | 55                  | 93                        | 9                              |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 0658          | 29.890                   | 57                  | 56                  | 96                        | 10                             | 9              | AS     | E100         | 1              | CS     | 250         | 10             | 11     |                |                |        |              |                |        | 10 | 5.000                           |                       |    |    |
| 0758          | 29.910                   | 59                  | 58                  | 96                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 0858          | 29.915                   | 60                  | 58                  | 87                        | 9                              |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 8  |                                 |                       |    |    |
| 0958          | 29.925                   | 64                  | 59                  | 75                        | 10                             | 1              | AC     | 70           | 7              | AC     | E120        | 8              | 2      | CS             | 250            | 10     | 0            |                |        | 8  | 2.035                           |                       |    |    |
| 1058          | 29.915                   | 64                  | 58                  | 67                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 1158          | 29.900                   | 63                  | 56                  | 65                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 1258          | 29.870                   | 62                  | 56                  | 70                        | 10                             | 1              | AC     | 70           | 8              | AS     | E120        | 9              | 1      | CI             | 250            | 10     | 11           |                |        | 10 | 8.055                           |                       |    |    |
| 1358          | 29.865                   | 64                  | 57                  | 65                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 1458          | 29.860                   | 61                  | 56                  | 72                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 9  |                                 |                       |    |    |
| 1558          | 29.860                   | 60                  | 56                  | 78                        | 10                             | 4              | AC     | 70           | 5              | AC     | E100        | 9              | 1      | CI             | 250            | 10     | 0            |                |        | 9  | 6.010                           |                       |    |    |
| 1658          | 29.860                   | 60                  | 55                  | 75                        | 9                              |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 8  |                                 |                       |    |    |
| 1758          | 29.870                   | 60                  | 55                  | 75                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 10 |                                 |                       |    |    |
| 1858          | 29.870                   | 60                  | 56                  | 78                        | 10                             | 10             | AS     | E100         | U              |        |             | U              |        |                |                |        |              |                |        | 10 | 3.010                           |                       |    |    |
| 1958          | 29.870                   | 60                  | 57                  | 78                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 10 |                                 |                       |    |    |
| 2058          | 29.875                   | 61                  | 57                  | 75                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 10 |                                 |                       |    |    |
| 2158          | 29.870                   | 60                  | 58                  | 87                        | 10                             | 10             | AS     | E100         | U              |        |             | U              |        |                |                |        |              |                |        | 10 | 0.000                           |                       |    |    |
| 2258          | 29.870                   | 60                  | 58                  | 87                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 10 |                                 |                       |    |    |
| 2358          | 29.865                   | 60                  | 57                  | 90                        | 10                             |                |        |              |                |        |             |                |        |                |                |        |              |                |        | 10 |                                 |                       |    |    |

SYNOPTIC OBSERVATIONS

SYNOPTIC OBSERVATIONS

OPNAV FORM 3140-6 (REV. 8-61)

NEAR FORM 13A

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |               |                                       |                               |       |   |                                  |               |                     |                        | STATION<br>NUSEN SAN CLEMENTE ISLAND<br>DATE<br>11 NOVEMBER 1971 |                      |
|---|---------------|---------------------------------------|-------------------------------|-------|---|----------------------------------|---------------|---------------------|------------------------|--|----------------------|
| Type  | Time<br>(LST) | Sky and ceiling<br>(hundreds of feet) | Visibility<br>(Statute Miles) |       | Weather<br>and<br>conditions<br>to vision | Sea<br>level<br>press.<br>(Hgs.) | Temp.<br>(°F) | Wind<br>dir.<br>(°) | Wind<br>speed<br>(kts) | Remarks and supplemental coded data                              | Observer<br>initials |
|   |               |                                       | Surface                       | Upper |   |                                  |               |                     |                        |  |                      |
| R   | 0758          | 0                                     | 7                             |       |   | 18.5                             | 52            | 25                  | 102                    | 705  | 705                  |
| R   | 0808          | 120                                   | 7                             |       |   | 18.1                             | 52            | 27                  | 102                    |  | 707                  |
| R   | 0828          | 120                                   | 7                             |       |   | 17.7                             | 53            | 29                  | 100                    |  | 708                  |
| R   | 0848          | 120                                   | 7                             |       |   | 18.2                             | 52            | 27                  | 104                    | 500 1010 55  | 707                  |
| R   | 0858          | 120                                   | 7                             |       |   | 18.3                             | 52            | 28                  | 103                    |  | 707                  |
| R   | 0908          | 120                                   | 7                             |       |   | 18.1                             | 52            | 29                  | 100                    |  | 707                  |
| R   | 0918          | 120                                   | 7                             |       |   | 18.2                             | 52            | 29                  | 100                    | 500 1028   | 707                  |
| R   | 0928          | 120                                   | 7                             |       |   | 18.9                             | 52            | 33                  | 102                    |  | 708                  |
| R   | 0938          | 120                                   | 7                             |       |   | 19.1                             | 52            | 34                  | 102                    | WIND LGT VRBL  | 708                  |
| R   | 0948          | 120                                   | 7                             |       |   | 19.4                             | 52            | 34                  | 103                    | 212 1058 55  | 708                  |
| R   | 0958          | 120                                   | 7                             |       |   | 19.1                             | 52            | 29                  | 104                    |  | 708                  |
| R   | 1008          | 120                                   | 7                             |       |   | 18.6                             | 53            | 29                  | 105                    |  | 708                  |
| R   | 1018          | 120                                   | 7                             |       |   | 17.6                             | 52            | 27                  | 103                    |  | 708                  |
| R   | 1028          | 120                                   | 7                             |       |   | 17.4                             | 52            | 27                  | 105                    | 819 1072   | 708                  |
| R   | 1038          | 120                                   | 7                             |       |   | 17.2                             | 52            | 27                  | 104                    | 8190VC   | 708                  |
| R   | 1048          | 120                                   | 7                             |       |   | 17.2                             | 53            | 22                  | 104                    | 8190VC/RE15/60300 1052 65  | 708                  |
| R   | 1058          | 120                                   | 7                             |       |   | 17.2                             | 52            | 20                  | 106                    |  | 708                  |
| R   | 1108          | 120                                   | 7                             |       |   | 17.6                             | 52            | 20                  | 104                    |  | 708                  |
| R   | 1118          | 120                                   | 7                             |       |   | 17.6                             | 52            | 20                  | 104                    | 303 1070   | 708                  |
| R   | 1128          | 120                                   | 7                             |       |   | 17.6                             | 52            | 13                  | 102                    |  | 708                  |
| R   | 1138          | 120                                   | 7                             |       |   | 17.7                             | 53            | 00                  | 100                    |  | 708                  |
| R   | 1148          | 120                                   | 7                             |       |   | 17.6                             | 52            | 21                  | 106                    | 000 1070 65  | 708                  |
| R   | 1158          | 120                                   | 7                             |       |   | 17.6                             | 52            | 18                  | 105                    |  | 708                  |
| R   | 1208          | 120                                   | 7                             |       |   | 17.6                             | 52            | 17                  | 104                    |  | 708                  |

Non observation.



DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

NRAN 10B

STATION ANUJED SAN CLEMENTE ISLAND DATE 12 NOVEMBER 1971

| CLOUDS AND OBSCURING PHENOMENA |                                  |                     |                     |                         |                                |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             |                       |                |        |    |    |
|--------------------------------|----------------------------------|---------------------|---------------------|-------------------------|--------------------------------|--------------------------------|----------------|--------|--------------|----------------|--------|-------------------------|------|----------------|--------------|-------------------------|------|--------------------------------|-----------------------------|-----------------------|----------------|--------|----|----|
| TIME<br>(LST)                  | STATION<br>PRES.<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMIDITY<br>(%) | REL.<br>WIND<br>SPEED<br>(KTS) | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |                         |      |                |              |                         |      | TOTAL<br>OPAQE<br>SKY<br>COVER | WIND<br>DIR<br>DUR<br>SPEED | NET<br>3-HR<br>CHANGE |                |        |    |    |
|                                |                                  |                     |                     |                         |                                | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER             |      |                | FOURTH LAYER |                         |      |                                |                             |                       |                |        |    |    |
|                                |                                  |                     |                     |                         |                                | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | SUM-<br>MATION<br>TOTAL | AMT. | TYPE &<br>DIR. | HEIGHT       | SUM-<br>MATION<br>TOTAL | AMT. |                                |                             |                       | TYPE &<br>DIR. | HEIGHT |    |    |
| 16                             | 17                               | 18                  | 19                  | 20                      | 21                             | 22                             | 23             | 24     | 25           | 26             | 27     | 28                      | 29   | 30             | 31           | 32                      | 33   | 34                             | 35                          | 36                    | 37             | 38     | 39 | 40 |
| 0058                           | 27.840                           | 60                  | 58                  | 90                      | 10                             | 10                             | ST             | M5     | U            |                |        |                         | U    |                |              |                         |      | U                              |                             | 10                    | 8              | 030    |    |    |
| 0158                           | 27.840                           | 60                  | 58                  | 90                      | 10                             |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 10                    |                |        |    |    |
| 0258                           | 27.840                           | 60                  | 57                  | 93                      | 10                             |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 10                    |                |        |    |    |
| 0358                           | 27.830                           | 60                  | 58                  | 90                      | 9                              | 9                              | ST             | M10    | 0            |                |        | 9                       | 0    |                |              |                         |      | 9                              | 0                           | 9                     | 8              | 010    |    |    |
| 0458                           | 27.840                           | 59                  | 57                  | 90                      | 9                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 9                     |                |        |    |    |
| 0558                           | 27.860                           | 58                  | 56                  | 87                      | 1                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 1                     |                |        |    |    |
| 0658                           | 27.880                           | 58                  | 57                  | 93                      | 1                              | 1                              | CU             | 10     | 0            |                |        | 1                       | 0    |                |              |                         |      | 1                              | 0                           | 1                     | 3              | 050    |    |    |
| 0758                           | 27.900                           | 59                  | 56                  | 83                      | 3                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 3                     |                |        |    |    |
| 0858                           | 27.920                           | 59                  | 56                  | 80                      | 7                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 7                     |                |        |    |    |
| 0958                           | 27.935                           | 60                  | 55                  | 75                      | 4                              | 4                              | CU             | 10     | 0            |                |        | 4                       | 0    |                |              |                         |      | 4                              | 0                           | 4                     | 1              | 055    |    |    |
| 1058                           | 27.935                           | 61                  | 55                  | 67                      | 3                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 3                     |                |        |    |    |
| 1158                           | 27.915                           | 62                  | 54                  | 66                      | 2                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 2                     |                |        |    |    |
| 1258                           | 27.910                           | 61                  | 54                  | 62                      | 5                              | 5                              | CU             | 10     | 0            |                |        | 5                       | 0    |                |              |                         |      | 5                              | 0                           | 5                     | 8              | 025    |    |    |
| 1358                           | 27.905                           | 62                  | 54                  | 60                      | 2                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 2                     |                |        |    |    |
| 1458                           | 27.905                           | 61                  | 54                  | 62                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |
| 1558                           | 27.895                           | 60                  | 52                  | 58                      | 0                              | 0                              |                |        | 0            |                |        | 0                       | 0    |                |              |                         |      | 0                              | 0                           | 0                     | 8              | 015    |    |    |
| 1658                           | 27.900                           | 58                  | 52                  | 67                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |
| 1758                           | 27.920                           | 57                  | 62                  | 72                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |
| 1858                           | 27.925                           | 56                  | 52                  | 77                      | 0                              | 0                              |                |        | 0            |                |        | 0                       | 0    |                |              |                         |      | 0                              | 0                           | 0                     | 2              | 030    |    |    |
| 1958                           | 27.975                           | 56                  | 53                  | 80                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |
| 2058                           | 27.925                           | 56                  | 53                  | 80                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |
| 2158                           | 27.940                           | 56                  | 53                  | 80                      | 0                              | 0                              |                |        | 0            |                |        | 0                       | 0    |                |              |                         |      | 0                              | 0                           | 0                     | 3              | 015    |    |    |
| 2258                           | 27.940                           | 56                  | 53                  | 80                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |
| 2358                           | 27.925                           | 56                  | 53                  | 83                      | 0                              |                                |                |        |              |                |        |                         |      |                |              |                         |      |                                |                             | 0                     |                |        |    |    |

OPNAV FORM 3140-6 (REV. 8-61)

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |                                       |                               |              |   |                                 |               |                    |                           |                        | STATION<br>NAMES SAN CLEMENTE LAND |                                     |                                |
|---|---------------------------------------|-------------------------------|--------------|---|---------------------------------|---------------|--------------------|---------------------------|------------------------|------------------------------------|-------------------------------------|--------------------------------|
|   |                                       |                               |              |   |                                 |               |                    |                           |                        | DATE<br>12 NOVEMBER 1971           |                                     |                                |
| Time<br>(LST)   | Sky and ceiling<br>(Hundreds of feet) | Visibility<br>(Statute Miles) |              | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>press.<br>(mb.) | Temp.<br>(°F) | Dew<br>pt.<br>(°F) | Wind<br>direction<br>(°T) | Wind<br>speed<br>(kts) | Wind<br>gust<br>(kts)              | Remarks and supplemental coded data | Observer<br>name<br>(initials) |
|   |                                       | Surface<br>(a)                | Lower<br>(b) |   |                                 |               |                    |                           |                        |                                    |                                     |                                |
| 0058  | M5A                                   | 8                             |              | RW--F                                       | 16.6                            | 60            | 57                 | 19                        | 104                    | 202                                | 810 1611                            | 14                             |
| 0158  | E5A                                   | 10                            |              | RW F  | 16.6                            | 60            | 57                 | 20                        | 106                    | 202                                |                                     | 14                             |
| 0258  | WIX                                   | 10                            |              | F   | 16.6                            | 60            | 58                 | 25                        | 106                    | 202                                |                                     | 14                             |
| 0358  | M10D                                  | 3                             |              | F   | 16.6                            | 60            | 57                 | 26                        | 106                    | 201                                | 80304/1600 60                       | 14                             |
| 0458  | F10D                                  | 3                             |              | F   | 16.6                            | 59            | 56                 | 29                        | 111                    | 202                                |                                     | 14                             |
| 0558  | 10D                                   | 7                             |              |   | 17.2                            | 58            | 54                 | 28                        | 107                    | 204                                |                                     | 14                             |
| 0658  | 10D                                   | 20                            |              |   | 17.9                            | 58            | 56                 | 27                        | 108                    | 206                                | 317 1100                            | 14                             |
| 0735  | E10D                                  | 20                            |              |   | 18.6                            | 59            | 54                 | 28                        | 111                    | 208                                |                                     | 14                             |
| 0758  | 10D                                   | 25                            |              |   |                                 |               |                    | 29                        | 112                    | 208                                |                                     | 14                             |
| 0830  | E10D                                  | 25                            |              |   |                                 |               |                    | 30                        | 111                    | 208                                | 0000                                | 14                             |
| 0858  | E10D                                  | 25                            |              |   | 19.3                            | 59            | 53                 | 30                        | 113                    | 210                                |                                     | 14                             |
| 0958  | 10D                                   | 30                            |              |   | 19.8                            | 60            | 52                 | 32                        | 111                    | 212                                | 119 1100 58                         | 14                             |
| 1058  | 10D                                   | 30                            |              |   | 19.8                            | 61            | 50                 | 31                        | 113                    | 212                                |                                     | 14                             |
| 1128  | 10D                                   | 30                            |              |   |                                 | 62            | 48                 | 31                        | 111                    | 211                                | ACFT NUSCAP                         | 14                             |
| 1158  | 10D                                   | 30                            |              |   | 19.1                            | 62            | 49                 | 30                        | 111                    | 210                                |                                     | 14                             |
| 1258  | 10D                                   | 30                            |              |   | 18.9                            | 61            | 48                 | 31                        | 110                    | 209                                | 808 1100                            | 14                             |
| 1358  | 10D                                   | 30                            |              |   | 18.1                            | 62            | 48                 | 30                        | 111                    | 209                                |                                     | 14                             |
| 1458  | 0                                     | 30                            |              |   | 18.8                            | 61            | 48                 | 30                        | 110                    | 209                                | FEW Sc NE                           | 14                             |
| 1558  | 0                                     | 30                            |              |   | 18.4                            | 60            | 45                 | 29                        | 112                    | 208                                | 805 63                              | 14                             |
| 1658  | 0                                     | 30                            |              |   | 18.6                            | 58            | 47                 | 28                        | 110                    | 208                                |                                     | 14                             |
| 1758  | 0                                     | 15                            |              |   | 19.3                            | 57            | 48                 | 29                        | 112                    | 210                                |                                     | 14                             |
| 1858  | 0                                     | 10                            |              |   | 19.4                            | 56            | 49                 | 30                        | 112                    | 211                                | 210                                 | 14                             |
| 1958  | 0                                     | 10                            |              |   | 19.4                            | 56            | 50                 | 30                        | 112                    | 211                                | WND 260V330                         | 14                             |
| 2058  | 0                                     | 10                            |              |   | 19.4                            | 56            | 50                 | 30                        | 116                    | 211                                | WND 280V320                         | 14                             |
| 2158  | 0                                     | 10                            |              |   | 20.0                            | 56            | 50                 | 30                        | 116                    | 212                                | WND 280V320 305 63                  | 14                             |
| 2258  | 0                                     | 15                            |              |   | 20.0                            | 56            | 50                 | 30                        | 116                    | 212                                | WND 280V310                         | 14                             |
| 2358  | 0                                     | 15                            |              |   | 19.4                            | 56            | 51                 | 30                        | 112                    | 211                                |                                     | 14                             |

AVIATION OBSERVATION.



OPNAV FORM 3140-7 (4-65)  
0107-711-1001

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

SEAW 108

| TIME<br>(LST) | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HUMID-<br>ITY<br>(%) | SEA<br>STATE | CLOUDS AND OBSCURING PHENOMENA |                |        |              |                |        |             |                |        |              |                |        | TOTAL<br>OPAQE<br>SKY<br>COVER | NET<br>3-HR<br>CHANCE | SEA<br>STATE |
|---------------|----------------------------------|---------------------|---------------------|------------------------------|--------------|--------------------------------|----------------|--------|--------------|----------------|--------|-------------|----------------|--------|--------------|----------------|--------|--------------------------------|-----------------------|--------------|
|               |                                  |                     |                     |                              |              | LOWEST LAYER                   |                |        | SECOND LAYER |                |        | THIRD LAYER |                |        | FOURTH LAYER |                |        |                                |                       |              |
|               |                                  |                     |                     |                              |              | AMT.                           | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT | AMT.        | TYPE &<br>DIR. | HEIGHT | AMT.         | TYPE &<br>DIR. | HEIGHT |                                |                       |              |
| 0005          | 21.725                           | 56                  | 53                  | 85                           | 0            | 0                              |                |        | 0            |                |        | 0           |                |        | 0            |                | 0      | 7.015                          |                       |              |
| 0105          | 21.700                           | 56                  | 53                  | 81                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 0205          | 21.910                           | 56                  | 54                  | 80                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 0305          | 21.910                           | 57                  | 54                  | 80                           | 1            | 1                              | 51             | 10     | 0            |                |        |             |                |        |              |                | 1      | 6.015                          |                       |              |
| 0405          | 21.920                           | 57                  | 54                  | 83                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 0505          | 21.930                           | 56                  | 53                  | 83                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 0605          | 21.940                           | 56                  | 53                  | 83                           | 1            | 2                              | 50             | 10     | 0            |                |        |             |                |        |              |                | 2      | 7.015                          |                       |              |
| 0705          | 21.940                           | 58                  | 54                  | 77                           | 6            |                                |                |        |              |                |        |             |                |        |              |                | 6      |                                |                       |              |
| 0805          | 21.955                           | 60                  | 55                  | 72                           | 4            |                                |                |        |              |                |        |             |                |        |              |                | 4      |                                |                       |              |
| 0905          | 21.955                           | 61                  | 55                  | 67                           | 3            | 3                              | 50             | 20     | 0            |                |        |             |                |        |              |                | 3      | 1.015                          |                       |              |
| 1005          | 21.935                           | 62                  | 54                  | 60                           | 3            |                                |                |        |              |                |        |             |                |        |              |                | 3      |                                |                       |              |
| 1105          | 21.910                           | 62                  | 55                  | 62                           | 3            |                                |                |        |              |                |        |             |                |        |              |                | 3      |                                |                       |              |
| 1205          | 21.875                           | 62                  | 54                  | 60                           | 2            | 2                              | 50             | 20     | 0            |                |        |             |                |        |              |                | 2      | 6.060                          |                       |              |
| 1305          | 21.850                           | 63                  | 55                  | 53                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 1405          | 21.870                           | 61                  | 54                  | 55                           | 3            |                                |                |        |              |                |        |             |                |        |              |                | 3      |                                |                       |              |
| 1505          | 21.810                           | 60                  | 54                  | 67                           | 5            | 4                              | CU             | 10     | 1            | AC             | 120    | 5           | 0              |        |              |                | 5      | 7.035                          |                       |              |
| 1605          | 21.855                           | 58                  | 53                  | 75                           | 4            |                                |                |        |              |                |        |             |                |        |              |                | 4      |                                |                       |              |
| 1705          | 21.740                           | 58                  | 53                  | 80                           | 10           |                                |                |        |              |                |        |             |                |        |              |                | 10     |                                |                       |              |
| 1805          | 21.820                           | 53                  | 53                  | 80                           | 2            | 2                              | 50             | 10     | 0            |                |        |             |                |        |              |                | 2      | 7.020                          |                       |              |
| 1905          | 21.870                           | 57                  | 54                  | 80                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 2005          | 21.820                           | 60                  | 50                  | 60                           | 1            |                                |                |        |              |                |        |             |                |        |              |                | 1      |                                |                       |              |
| 2105          | 21.820                           | 56                  | 51                  | 72                           | 1            | 1                              | 51             | 10     | 0            |                |        |             |                |        |              |                | 1      | 7.020                          |                       |              |
| 2205          | 21.820                           | 55                  | 51                  | 72                           | 0            |                                |                |        |              |                |        |             |                |        |              |                | 0      |                                |                       |              |
| 2305          | 21.820                           | 55                  | 51                  | 72                           | 0            |                                |                |        |              |                |        |             |                |        |              |                | 0      |                                |                       |              |

SYNOPTIC OBSERVATIONS

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |             |                                       |                               |       |   |                                   |               |       |                        |                     |                           |                                |                                     | STATION<br>UNSED SAN CLEMENTE ISLAND |       |    |
|---|-------------|---------------------------------------|-------------------------------|-------|---|-----------------------------------|---------------|-------|------------------------|---------------------|---------------------------|--------------------------------|-------------------------------------|--------------------------------------|-------|----|
| DATE<br>13 NOVEMBER 1971  |             |                                       |                               |       |   |                                   |               |       |                        |                     |                           |                                |                                     |                                      |       |    |
| Type  | Time<br>(Z) | Sky and ceiling<br>(Hundreds of Feet) | Visibility<br>(Statute Miles) |       | Weather<br>and<br>obstructions<br>to vision | Sea<br>level<br>pressure<br>(mb.) | Wind<br>(Kts) |       | Wave<br>height<br>(ft) | Direction<br>(true) | Current<br>speed<br>(kts) | Current<br>direction<br>(true) | Remarks and supplemental coded data | Observer                             | Check |    |
|   |             |                                       | Surface                       | Upper |   |                                   | (Kts)         | (Kts) |                        |                     |                           |                                |                                     |                                      |       |    |
| R   | 0030        | 0                                     | 10                            |       |   | 19.4                              | 56            | 67    | 30                     | 111                 |                           |                                | 011                                 |                                      |       | BK |
| R   | 0150        | 100                                   | 10                            |       |   | 18.6                              | 52            | 51    | 30                     | 111                 |                           |                                | 008                                 |                                      |       | BK |
| R   | 0258        | 100                                   | 7                             |       |   | 18.9                              | 56            | 52    | 30                     | 110                 |                           |                                | 009                                 |                                      |       | BK |
| R   | 0358        | 100                                   | 10                            |       |   | 18.9                              | 57            | 51    | 30                     | 110                 |                           |                                | 011                                 |                                      |       | BK |
| R   | 0458        | 100                                   | 15                            |       |   | 19.6                              | 56            | 51    | 30                     | 112                 |                           |                                | 011                                 |                                      |       | BK |
| R   | 0658        | 100                                   | 15                            |       |   | 20.0                              | 56            | 51    | 30                     | 113                 |                           |                                | 012                                 |                                      |       | BK |
| R   | 0758        | 100                                   | 25                            |       |   | 20.7                              | 58            | 51    | 31                     | 112                 |                           |                                | 014                                 |                                      |       | BK |
| R   | 0858        | 200                                   | 25                            |       |   | 20.5                              | 60            | 51    | 33                     | 110                 |                           |                                | 014                                 |                                      |       | BK |
| R   | 0958        | 200                                   | 25                            |       |   | 20.5                              | 61            | 50    | 33                     | 108                 |                           |                                | 014                                 |                                      |       | BK |
| R   | 1058        | 200                                   | 25                            |       |   | 19.8                              | 62            | 48    | 32                     | 110                 |                           |                                | 012                                 |                                      |       | BK |
| R   | 1158        | 200                                   | 25                            |       |   | 18.9                              | 62            | 49    | 31                     | 114                 |                           |                                | 009                                 |                                      |       | BK |
| R   | 1258        | 200                                   | 25                            |       |   | 18.4                              | 62            | 48    | 31                     | 115                 | 619                       | 008                            |                                     |                                      |       | BK |
| R   | 1358        | 200                                   | 25                            |       |   | 17.9                              | 63            | 48    | 31                     | 113                 | 618                       | 006                            |                                     |                                      |       | BK |
| R   | 1458        | 200                                   | 25                            |       |   | 17.6                              | 61            | 49    | 30                     | 113                 |                           | 009                            |                                     |                                      |       | BK |
| R   | 1558        | 100                                   | 25                            |       |   | 17.2                              | 60            | 50    | 30                     | 113                 |                           | 009                            |                                     |                                      |       | BK |
| R   | 1658        | 100                                   | 20                            |       |   | 17.1                              | 58            | 50    | 29                     | 114                 |                           | 009                            |                                     |                                      |       | BK |
| S   | 1735        | 190                                   | 7                             |       |   |                                   |               |       | 29                     | 115                 | 620                       | 003                            |                                     |                                      |       | BK |
| R   | 1758        | 100                                   | 7                             |       |   | 16.7                              | 58            | 52    | 30                     | 114                 |                           | 003                            |                                     |                                      |       | BK |
| R   | 1858        | 100                                   | 10                            |       |   | 16.6                              | 58            | 52    | 27                     | 110                 |                           | 002                            |                                     |                                      |       | BK |
| R   | 1958        | 100                                   | 16+                           |       |   | 16.2                              | 57            | 51    | 28                     | 111                 |                           | 001                            |                                     |                                      |       | BK |
| R   | 2058        | 100                                   | 15+                           |       |   | 16.1                              | 56            | 45    | 30                     | 116                 | 623                       | 002                            |                                     |                                      |       | BK |
| R   | 2158        | 100                                   | 15+                           |       |   | 15.9                              | 56            | 47    | 28                     | 116                 | 623                       | 000                            |                                     |                                      |       | BK |
| R   | 2258        | 0                                     | 15+                           |       |   | 15.9                              | 56            | 47    | 29                     | 117                 | 625                       | 000                            |                                     |                                      |       | BK |
| R   | 2358        | 0                                     | 15+                           |       |   | 15.4                              | 56            | 46    | 30                     | 117                 | 623                       | 000                            |                                     |                                      |       | BK |

OBSERVATION

Best Available Copy

[illegible]

DEPARTMENT OF THE NAVY  
SURFACE WEATHER OBSERVATIONS  
(LAND STATIONS)

BRAN 108

STATION NOVED SAN CRISTITE ISLAND DATE 14 NOVEMBER 1971

| CLOUDS AND OBSCURING PHENOMENA |                                  |                     |                     |                                   |                                |                |    |        |                |    |        |                |    |        |                |    |        |                                       |                       |                                  |                                   |                              |      |
|--------------------------------|----------------------------------|---------------------|---------------------|-----------------------------------|--------------------------------|----------------|----|--------|----------------|----|--------|----------------|----|--------|----------------|----|--------|---------------------------------------|-----------------------|----------------------------------|-----------------------------------|------------------------------|------|
| TIME<br>(LST)                  | STATION<br>PRES-<br>SURE<br>(In) | DRY<br>BULB<br>(°F) | WET<br>BULB<br>(°F) | REL.<br>HU-<br>MID-<br>ITY<br>(%) | REL.<br>WIND<br>SPEED<br>(KTS) | LOWEST LAYER   |    |        | SECOND LAYER   |    |        | THIRD LAYER    |    |        | FOURTH LAYER   |    |        | TOTAL<br>OPAC-<br>ITY<br>SKY<br>COVER | NET<br>3-HR<br>CHANGE | NO.<br>OF<br>WIND<br>DIR.<br>CHG | NO.<br>OF<br>WIND<br>SPEED<br>CHG |                              |      |
|                                |                                  |                     |                     |                                   |                                | TYPE &<br>DIR. |    | HEIGHT | TYPE &<br>DIR. |    | HEIGHT | TYPE &<br>DIR. |    | HEIGHT | TYPE &<br>DIR. |    | HEIGHT |                                       |                       |                                  |                                   |                              |      |
|                                |                                  |                     |                     |                                   |                                | AMT.           | 22 |        | 23             | 24 |        | AMT.           | 25 |        | 26             | 27 |        |                                       |                       |                                  |                                   | SUM-<br>MA-<br>TION<br>TOTAL | AMT. |
| 15                             | 17                               | 18                  | 19                  | 20                                | 21                             | 22             | 23 | 24     | 25             | 26 | 27     | 28             | 29 | 30     | 31             | 32 | 33     | 34                                    | 35                    | 36                               | 37                                | 38                           | 39   |
| 0051                           | 21.125                           | 56                  | 51                  | 61                                | 0                              | 0              |    |        | 0              |    |        | 0              | 0  |        |                | 0  | 0      |                                       |                       | 0                                | 7                                 | 055                          |      |
| 0151                           | 21.116                           | 55                  | 50                  | 72                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 0251                           | 21.155                           | 55                  | 51                  | 74                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 0351                           | 21.112                           | 55                  | 49                  | 71                                | 0                              | 0              |    |        | 0              |    |        | 0              | 0  |        |                | 0  | 0      |                                       |                       | 0                                | 7                                 | 020                          |      |
| 0451                           | 21.101                           | 54                  | 50                  | 74                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 0551                           | 21.700                           | 55                  | 50                  | 71                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 3                                | 0                                 |                              |      |
| 0651                           | 21.100                           | 55                  | 51                  | 74                                | 0                              | 0              |    |        | 0              |    |        | 4              | 0  |        |                | 4  | 0      |                                       |                       | 3                                | 5                                 | 000                          |      |
| 0751                           | 21.120                           | 57                  | 51                  | 67                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 9                                | 0                                 |                              |      |
| 0851                           | 21.120                           | 58                  | 51                  | 60                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 7                                | 0                                 |                              |      |
| 0951                           | 21.175                           | 60                  | 52                  | 55                                | 0                              | 0              |    |        | 0              |    |        | 4              | 0  |        |                | 4  | 0      |                                       |                       | 4                                | 1                                 | 035                          |      |
| 1051                           | 21.785                           | 60                  | 52                  | 55                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 1                                | 0                                 |                              |      |
| 1151                           | 21.720                           | 62                  | 51                  | 47                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 1251                           | 21.740                           | 63                  | 51                  | 44                                | 0                              | 0              |    |        | 0              |    |        | 0              | 0  |        |                | 0  | 0      |                                       |                       | 0                                | 6                                 | 055                          |      |
| 1351                           | 21.735                           | 62                  | 51                  | 44                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 1451                           | 21.725                           | 62                  | 52                  | 46                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 1551                           | 21.720                           | 60                  | 51                  | 51                                | 0                              | 0              |    |        | 0              |    |        | 0              | 0  |        |                | 0  | 0      |                                       |                       | 0                                | 6                                 | 020                          |      |
| 1651                           | 21.720                           | 58                  | 50                  | 55                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 1751                           | 21.725                           | 57                  | 51                  | 64                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 1851                           | 21.710                           | 56                  | 51                  | 61                                | 0                              | 0              |    |        | 0              |    |        | 0              | 0  |        |                | 0  | 0      |                                       |                       | 0                                | 3                                 | 015                          |      |
| 1951                           | 21.710                           | 56                  | 51                  | 62                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       | 0                                | 0                                 |                              |      |
| 2051                           | 21.710                           | 56                  | 51                  | 61                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       |                                  |                                   |                              |      |
| 2151                           | 21.710                           | 56                  | 51                  | 61                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       |                                  |                                   |                              |      |
| 2251                           | 21.710                           | 56                  | 51                  | 61                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       |                                  |                                   |                              |      |
| 2351                           | 21.710                           | 56                  | 51                  | 61                                | 0                              | 0              |    |        |                |    |        |                |    |        |                |    |        |                                       |                       |                                  |                                   |                              |      |

SYNOPTIC OBSERVATIONS

OPNAV FORM 3100-6 (REV. 8-61)

| DEPARTMENT OF THE NAVY<br>SURFACE WEATHER OBSERVATIONS<br>(LAND STATIONS) |                                    |                            |       |                                    |                        |            |              |           |             | STATION<br>DUSTED SAND CREEK DIE ISLAND<br>DATE<br>14 DECEMBER 1971 |                  | Remarks and supplemental coded data |                           | Observed time                       |               |
|---|------------------------------------|----------------------------|-------|------------------------------------|------------------------|------------|--------------|-----------|-------------|---|------------------|-------------------------------------|---------------------------|-------------------------------------|---------------|
| Time (LST)  | Sky and ceiling (Hundreds of Feet) | Visibility (Statute miles) |       | Weather and obstructions to vision | Sea level press. (mb.) | Temp. (°F) | Dew pt. (°F) | Direction | Speed (kts) | Character of surface  | Wind dir. (true) | Wind speed (kts)                    | Barometric pressure (mb.) | Remarks and supplemental coded data | Observed time |
|   |                                    | Surface                    | Lower |                                    |                        |            |              |           |             |   |                  |                                     |                           |                                     |               |
| 01  | 0                                  | 15.4                       |       |                                    | 14.7                   | 56         | 46           | 31        | 118         | 623   | 19               | 19                                  | 712                       |                                     | 712           |
| 02  | 0                                  | 15.4                       |       |                                    | 14.7                   | 56         | 46           | 31        | 118         | 623   | 19               | 19                                  |                           |                                     | 712           |
| 03  | 0                                  | 15                         |       |                                    | 14.1                   | 55         | 47           | 31        | 120         | 625   | 19               | 19                                  |                           |                                     | 712           |
| 04  | 0                                  | 15                         |       |                                    | 13.8                   | 54         | 47           | 31        | 118         | 625   | 19               | 19                                  |                           |                                     | 712           |
| 05  | 0                                  | 15                         |       |                                    | 13.4                   | 54         | 47           | 32        | 118         | 617   | 19               | 19                                  |                           |                                     | 712           |
| 06  | 1000                               | 15.1                       |       |                                    | 13.3                   | 55         | 47           | 32        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 07  | 1000                               | 15.1                       |       |                                    | 13.8                   | 55         | 47           | 32        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 08  | 1500                               | 15.1                       |       |                                    | 14.7                   | 57         | 46           | 34        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 09  | 1500                               | 15.1                       |       |                                    | 14.7                   | 57         | 46           | 34        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 10  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 11  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 12  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 13  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 14  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 15  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 16  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 17  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 18  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 19  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 20  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 21  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 22  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 23  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 24  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 25  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 26  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 27  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 28  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 29  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 30  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 31  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 32  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 33  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 34  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 35  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 36  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 37  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 38  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 39  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 40  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 41  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 42  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 43  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 44  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 45  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 46  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 47  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 48  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 49  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 50  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 51  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 52  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 53  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 54  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 55  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 56  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 57  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 58  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 59  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 60  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 61  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 62  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 63  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 64  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 65  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 66  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 67  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 68  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 69  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 70  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 71  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 72  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 73  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 74  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 75  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 76  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 77  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 78  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 79  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 80  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 81  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 82  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 83  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 84  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 85  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 86  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 87  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 88  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 89  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 90  | 1500                               | 15.1                       |       |                                    | 15.1                   | 58         | 44           | 33        | 118         | 619   | 19               | 19                                  |                           |                                     | 712           |
| 91  | 1500                               | 15.1                       |       |                                    | 1                      |            |              |           |             |   |                  |                                     |                           |                                     |               |

NOTE: There are no required entries in columns without headings. "Any data needed locally may be entered".

## XI. ACKNOWLEDGEMENTS

The measurement program and the data analysis described in this report involved many people. The conscientious effort and enthusiasm of the following people was essential for the successful outcome of the project: K. D. Anderson, M. L. Fontenot, L. J. Goodson, W. K. Horner, Dr. D. R. Jensen, M. L. Phares, J. F. Theisen, and C. S. Thomas. Special appreciation goes to Dr. E. E. Gossard who initiated the project and whose guidance lead to our present knowledge of microwave radio propagation in the oceanic evaporation duct.

## Part II: Results from the Key West Measurements

## CONTENTS

|  | <u>Page</u> |
|--|-------------|
| SUMMARY  | 1           |
| I. BACKGROUND  | 2           |
| II. OBJECTIVE  | 4           |
| III. APPROACH  | 5           |
| IV. RESULTS  | 6           |
| A. Propagation Measurements                            | 6           |
| B. Meteorological Comparisons                          | 9           |
| V. CONCLUSIONS   | 13          |
| VI. RECOMMENDATIONS                                    | 14          |
| VII. REFERENCES  | 15          |
| VIII. FIGURES  | 16          |
| IX. TABLES   | 61          |
| X. APPENDIX (1972 Climatological Summary for Key West) | 78          |
| XI. ACKNOWLEDGEMENTS                                   | 83          |

## SUMMARY

Carefully controlled propagation measurements were performed for two weeks in May 1972 between Key West and the Marquesas Keys. Location and season were chosen in order to duplicate closely conditions under which measurements were performed by the Applied Physics Laboratory in 1970. The evaporation duct was found to influence X-band and Ku-band frequencies significantly. A low sited X-band antenna (16 feet above mean sea level) received higher signals 60% of the time compared to a high sited antenna (64 feet above mean sea level). Radio data and ducting conditions were found to be well correlated. It appears that ducting conditions encountered in May may be found during the rest of the year. These findings are in agreement with APL's conclusions. Whether these measurements over extremely shallow and reef protected waters can be considered representative of ducting conditions for all tropical climates remains to be established. APL's persistently measured extraordinary vertical gradients of signal strength could not be verified either by measurements or by calculations.

## I. BACKGROUND

Part I of this series of reports (reference 1) described extensive measurements in the Southern California off-shore area. These measurements investigated the influence of the oceanic surface evaporation duct on microwave radio propagation and more specifically the question of optimum shipboard antenna heights. The results for this area showed that the evaporation duct strongly influenced propagation conditions for X-band frequencies but rarely caused the signals to decrease with height (the condition for which low sited antennas receive higher signals and therefore produce larger detection ranges). These findings were in sharp contrast to measurements done by the Applied Physics Laboratory of the Johns Hopkins University in the Key West area during May 1970 (reference 2). While it was realized that the climatological conditions in the Key West area could produce significantly different ducting conditions, some of the APL data showed field strength versus height profiles with extraordinary vertical gradients. As an example, figure 1 shows averages of profiles measured by APL which display over 30 dB decreases in path loss with height within a few feet. All of these profiles were measured on a 40' telescopic mast having an elevator which carried the receiving antenna. A typical measured refractivity profile, shown in figure 2, was used to calculate a path loss versus height curve for a transmitter height of five feet. The calculations were performed using NELC's waveguide computer program. This program permits radio propagation conditions to be calculated in a waveguide with an arbitrary refractive index profile perpendicular to the direction of propagation. The calculated path loss versus height dependence for the refractivity profile of figure 2 is shown in figure 1 and labelled

NELC calculation. There are two distinct differences between the measured and the calculated profiles. First, the measured field strength (or path loss) values are 20-30 dB less than the calculated and second, the sharp decrease in the measured profiles occurs at a height range where the calculated profile changes very slowly. The discrepancy of both absolute values and shape between measured and calculated profiles in figure 1 is in contrast to the usually good agreement between NELC measured and calculated profiles. As shown in figure 3, even a fictitious refractivity profile with a 50 M-units change between 39' and 40' failed to produce a height gain function with vertical gradients similar to the measured curve in figure 1.

All measurements presented in reference 2 were conducted on 9 different days. One attempt to justify the unusual height gain profiles in reference 2 was that the 9 days were characterized by unusual meteorological conditions. These conditions might not have shown up in a measured refractivity profile like the one in figure 2 because it was measured over land. For these reasons it was decided to perform continuous propagation measurements under conditions that would closely duplicate APL's measurements. A nearly identical propagation path was selected and measurements were conducted during the same season.

## II. OBJECTIVE

Conduct in the Key West area well controlled measurements to assess the role of the oceanic surface evaporation duct on microwave radio propagation. Season and location of the measurements were chosen to coincide with APL's 1970 (reference 2) measurements in order to provide a basis for comparison of the data.

### III. APPROACH

Following the approach described in reference 1, a propagation link was established between two islands. The transmitter was placed on the Marquesas Keys and the receiving mast at the Naval Station in Key West. This path, shown in figure 4, is just slightly north of the APL path and about 2 miles shorter than buoy A location for the APL measurements. The NELC path was selected so that it did not cross any islands. The transmitter on the Marquesas Keys is shown in figure 5. It is the same arrangement described in reference 1 but with the addition of a Ku-band frequency (17.9643 GHz). This addition necessitated a separate antenna and the use of waveguide transmission lines. The Ku-band antenna gain was 36 dB and the radiated power 12 dBm. Transmitter antenna height was 7 feet above mean sea level (10' for the L-, S-, X-band antenna). Figure 6 shows a block diagram of the Ku-band transmitter.

The receiver mast is shown in figure 7. The antenna heights for L-, S-, and X-band were 16, 32, and 64 feet and for Ku-band 13, 29, and 61 feet. Figure 8 shows a block diagram for the Ku-band receiver (the receivers for the other frequencies are identical to the ones described in reference 1).

The minimum detectable signal for Ku-band was -100 dBm which permits a maximum path loss value of 184 dB to be measured. The performance of the Ku-band link was troubled by numerous difficulties and equipment failures. Therefore, data were gathered only intermittently during the observation period.

#### IV. RESULTS

##### A. Propagation Measurements

Figures 9-11 show in the upper portions path loss for the three vertically spaced L-band antennas as a function of time. Equipment failures are responsible for the missing data. The lower part of figures 9-11 shows the difference of the logarithmic path loss values for various antenna combinations. The data indicate that path loss decreases (or received power increases) with height. The path loss differences between higher and lower sited antennas are, therefore, always positive. The fading during five minute intervals for the three antennas is shown in figure 12. Fading as used here is the peak to peak signal fluctuation with respect to the mean signal level within a 5 minute interval. The time constant of the recording system eliminated fluctuation faster than 4 seconds. Higher fading is observed on the lower antennas. The information of figures 9-12 is presented in tabular form in table 1. The first block of numbers in table 1 gives the percentage of time signals received on the higher antenna exceed the signals received on the lower antenna by a certain value in dB. No reversals (i.e. higher signals on the low antenna) occurred during the measurement period. In 99.6% of the time the signals received on the high antenna exceeded the ones received on the low antenna by 6 dB. The second and third block in the upper part of table 1 give the mid-low and high-mid antenna comparison. The blocks in the lower portion of table 1 give the percentage of time specific fading values in dB are exceeded. Fading values larger than 5 dB are observed 0.3% of the time for the high antenna, 3.8% of the time for the middle antenna, and 7% of the time for the low antenna.

Frequency distributions of path loss, path loss difference between antenna combinations, and fading are shown in figures 13-15. The corresponding numbers are listed in tables 2-4. The presentation of figures 13-15 is believed to provide a convenient visual aid in judging quantitative effects of ducting on the vertically spaced antennas.

Figures 16-18 show path loss and path loss differences for the various antenna combinations for S-band. Also for this frequency, received signals increase with antenna height and fading, shown in figure 19, decreases with antenna height. Missing data are, again, due to equipment failures. Table 5 presents the information of figures 16-19 in tabular form. The frequency distributions for S-band are shown in figures 20-22 and tabulated in tables 6-8.

While ducting conditions did not appear to have a significant influence on L- and S-band frequencies, they did have an influence on higher frequencies. Figures 23-25 show path loss and path loss differences between antenna combinations for X-band. Path loss dramatically increases with antenna height shifting the path loss difference curves to negative values a large percentage of the time. Also, the fading trend is reversed as shown in figure 26. Under conditions of strong ducting, e.g. between 10-14 May, the signals are quite high and little fading occurs on the low antenna. The physical interpretation of this phenomenon is that the evaporation duct strongly trapped the energy close to the water surface. This resulted in high, non-fluctuating signals close to the water and in low, fluctuating signals higher up. However, even though strong trapping conditions may persist over days as shown in the above example, they also

may break up rapidly. Signal changes in the order of 30 dB may occur in relatively short time intervals. The period of 14-20 May was characterized by such fluctuations. Table 9 shows that the lower antenna received equal or higher signals 61.4% of the time and exceeded the higher antenna by 10 dB 37.1% of the time. However, a 20 dB difference between the high and the low antenna was observed only 3.9% of the time. Strong gradients between adjacent antennas were measured infrequently. Only in about 1% of the time was a 15 dB difference observed between the high and the middle antenna or the middle and the low antenna. Persistent, strong gradients measured by APL at even lower frequencies (C-band) are not evident in these data.

In figure 27 the distributions of path loss for the three antennas illustrate an interesting effect ducting may have on various antenna heights. The lowest antenna shows the widest spread of path loss with the spread narrowing as antenna height increases. Ducting conditions characterized by duct heights in the range from approximately 30-100 feet affect the low antenna more than the higher ones which explains the low path loss values. Under other ducting conditions (notably neutral conditions), the lower antenna receives smaller signals than higher antennas which results in high path loss values for the low antenna. Siting an antenna low will, therefore, yield both extremes of much higher and much lower signals depending on ducting conditions. Table 10 lists the numerical values for figure 27. Also figure 28 (numerical values in table 11) shows distributions with different spread. However in this case, the spread is both an indication of stronger ducting effects on lower antennas

and an indication of spatial correlation. The spatial separation is largest (48 feet) for the high-low antenna combination and smallest (16 feet) for the mid-low antenna combination. Accordingly, the high-mid combination shows the narrowest spread and the high-low antenna the widest spread. Finally, figure 29 (numerical values in table 12) shows the fading distribution. The physical reason for the lesser fading on the low antennas had been explained above.

Every effort was made to include Ku-band into the Key West measurements. Slippage of delivery schedules by the manufacturers resulted in delivery of the major components after the propagation experiment had started. The Ku-band propagation link was assembled in Key West under field operation conditions and performed so unreliably that only spotty measurements were obtained. They resulted in a total observation time of approximately 30 hours and are included here for completeness. Figures 30-36 and tables 13-16 follow the same format as the previously discussed frequencies and show that Ku-band, similar to X-band, was strongly affected by the existing ducting conditions. During the 30 hours of observation, the lower antenna received equal or higher signals than the high antenna 76.8% of the time and outperformed the high antenna by 10 dB during 63.6% of the time.

#### B. Meteorological Comparisons

No meteorological measurements were performed by NELC at Key West except measurement of sea water temperatures at the receiver site. These sea water temperature measurements were used in connection with the standard weather bureau data taken at the international airport in Key West (see appendix for station location) in order to calculate duct height.

Figures 37 and 38 are plots (at every three hours during the measurement period) of relative humidity, wind speed, air-sea temperature difference, and air temperature. Those data were used to calculate duct height  $\delta$  assuming a log-linear profile (Monin-Obukhov profile) according to the following formulas:

$$\delta = - \left[ \frac{0.0013 \left( \ln \frac{z_1}{z_0} + \frac{z_1}{L'} \right)}{\phi_A - \phi_S} + \frac{\alpha}{L'} \right]^{-1} \text{ cm}$$

$$\phi_A = \frac{77.6}{T_A} \left[ 1000 + \frac{4810}{T_A} e \right]$$

$$\phi_S = \frac{77.6}{T_{SW}} \left[ 1000 + \frac{4810}{T_{SW}} e_{SW} \right]$$

$$L' = \frac{\frac{(u \cdot 51.4444)^2}{980 (T_A - T_{SW})} - \alpha z_1}{\frac{T_{SW}}{\ln \frac{z_1}{z_0}}} \text{ cm}$$

$$z_1 = 500 \text{ cm}$$

$$z_0 = 0.0015 \text{ cm } (u \leq 10 \text{ Knots})$$

$$\alpha = 2.0$$

e in mb, T in Kelvin, u in knots

$T_A$  = air temperature

$T_{SW}$  = sea water surface temperature

$e_{SW}$  = saturated vapor pressure at sea surface

Conditions of thermal stability with bulk Richardson's numbers exceeding 0.1 were eliminated for duct height calculations. Bulk Richardson's number is given by

$$R_{ib} = 6.4 \frac{T_A - T_{SW}}{u^2}$$

T in Kelvin, u in knots

Figure 39 shows calculated duct height for the measurement period. Variations in duct height follow closely variations in wind speed. This is not too surprising as the other parameters influencing duct height showed less variation than wind speed. Therefore, the close correlation of wind speed and duct height observed during 8-22 May 1972 at Key West can not be generalized. Figures 40 and 41 are overlays of path loss for the low X-band antenna (figure 25) and duct height and wind speed. The correlation between signal levels (path loss values) and duct heights is remarkable particularly if one considers the serious shortcomings of the meteorological data (air temperature, relative humidity, and wind velocity measured

over land, sea water temperature measured close to shore). The good agreement between routinely measured meteorological data and propagation data suggested calculations of duct height for a longer period in order to see whether propagation conditions would be expected to be different in other periods. Considerable time was spent to locate useable sea water temperature measurements taken for at least one year. Surface water temperature measurements were finally obtained from the Marine Research Foundation in Key West. The data were taken from August 1970 to October 1971 in the vicinity of Stock Island (exact location:  $24^{\circ} 33.05' N$ ,  $81^{\circ} 44.10' W$ ). The water depth at this location is approximately 8-10 feet. The data were taken between 1100-1300. The 1000 hours and the daily average readings of the landbased weather bureau data were used to calculate duct heights rather than the 1300 hours readings. At 1300, solar heating of the ground would be expected to overestimate air temperatures over the water. Figures 42 and 43 show duct heights calculated (for every third day) for the two sets of weather bureau readings. Duct heights calculated from this data base appear to be generally higher than the values for the May measurement period which may be due to a bias in the data. The important feature of figures 42 and 43 seems to be absence of significant seasonal changes on duct height. One may, therefore, conclude that the ducting condition measured in May will be similar during the rest of the year. It should be emphasized again that this conclusion is based on meteorological data whose use for duct height calculations may be seriously questioned.

## V. CONCLUSIONS

During a two week measurement period in the Key West area ducting conditions were encountered which significantly influenced X-band and Ku-band frequencies. A low sited X-band antenna (16' above msl) received higher signals 60% of the time compared to a high sited antenna (64' above msl). Radio data and ducting conditions were found to be well correlated. It appears that ducting conditions encountered in May may be found during the rest of the year. These findings are in agreement with APL's conclusions. Whether these measurements over extremely shallow and reef protected waters can be considered representative of ducting conditions for all tropical climates remains to be established. APL's persistently measured extraordinary vertical gradients of signal strength could not be verified either experimentally or through various modelling attempts.

## VI. RECOMMENDATIONS

Calculations of radio propagation conditions in the oceanic surface evaporation duct based on the use of existing climatological data have been found to agree reasonably well with actual measurements. It is, therefore, recommended to search for good climatological data in navigable tropical waters in order to establish whether ducting conditions in shallow waters of the Florida Keys are in fact representative of other tropical water bodies.

## VII. REFERENCES

1. Richter, J. H. and H. V. Hitney, "Antenna heights for optimum utilization of the oceanic surface evaporation duct". Part I: Results from the Pacific measurements. NELC TN 2031, 4 May 1972.
2. Smith, G. "Description of the maritime ducting radar investigation and final report on the Key West experiment", APL Fleet Systems Report SMS-FS-425 (MRD-0-317) October 1970.

## VIII. FIGURES

Page

|  |    |
|--|----|
| 1. Measured and calculated path loss versus height profiles. The measured profiles were obtained at Key West at 5850 MHz, over a 17 nmi path, for transmitter heights from 5'-25' and are averaged over days (from figure 41 of reference 2). The calculated profile is based on the M-curve of figure 2 and a transmitter height of 5'. | 19 |
| 2. Refractivity profile used to calculate the path loss versus height profile of figure 1 (from figure 167 reference 2).   | 20 |
| 3. Fictitious M-profile with 50 M-unit change between 39' and 40' and corresponding path loss versus height profile.   | 21 |
| 4. Geographic location of propagation path.  | 22 |
| 5. Transmitter on the Marquesa Keys.   | 23 |
| 6. Block diagram of Ku-band transmitter.   | 23 |
| 7. Receiving mast at the Key West Naval Station.   | 24 |
| 8. Block diagram of Ku-band receiver.  | 25 |
| 9. Path loss for high L-band antenna and path loss difference high-low antenna.  | 26 |
| 10. Path loss for middle L-band antenna and path loss difference mid-low antenna.  | 27 |
| 11. Path loss for low L-band antenna and difference high-mid antenna.  | 28 |
| 12. Fading L-band.   | 29 |
| 13. Frequency distributions of path loss for L-band.   | 30 |
| 14. Frequency distributions of path loss differences between antenna for L-band.   | 31 |
| 15. Frequency distribution of fading L-band.   | 32 |

|  |    |
|--|----|
| 16. Path loss for high S-band antenna and path loss difference high-low antenna.   | 31 |
| 17. Path loss for middle S-band antenna and path loss difference mid-low antenna.  | 32 |
| 18. Path loss for low S-band antenna and path loss difference high-mid antenna.    | 33 |
| 19. Fading S-band.   | 34 |
| 20. Frequency distributions of path loss for S-band.                               | 35 |
| 21. Frequency distributions of path loss differences between antennas for S-band.  | 38 |
| 22. Frequency distributions of fading for S-band.                                  | 39 |
| 23. Path loss for high X-band antenna and path loss difference high-low antenna.   | 40 |
| 24. Path loss for middle X-band antenna and path loss difference mid-low antenna.  | 41 |
| 25. Path loss for low X-band antenna and path loss difference high-mid antenna.    | 42 |
| 26. Fading X-band.   | 43 |
| 27. Frequency distributions of path loss for X-band.                               | 44 |
| 28. Frequency distributions of path loss differences between antennas for X-band.  | 45 |
| 29. Frequency distributions of fading for X-band.                                  | 46 |
| 30. Path loss for high Ku-band antenna and path loss difference high-low antenna.  | 47 |
| 31. Path loss for middle Ku-band antenna and path loss difference mid-low antenna. | 48 |

|   |             |
|---|-------------|
|   | <u>Page</u> |
| 32. Path loss for low Ku-band antenna and path loss difference high-mid antenna.                    | 49          |
| 33. Fading Ku-band.   | 50          |
| 34. Frequency distributions of path loss for Ku-band.   | 51          |
| 35. Frequency distributions of path loss differences for Ku-band.                                   | 52          |
| 36. Frequency distributions of fading for Ku-band.  | 53          |
| 37. Relative humidity and wind speed for 8-22 May 1972 at Key West.                                 | 54          |
| 38. Air temperature - sea temperature difference and air temperature for 8-22 May 1972 at Key West. | 55          |
| 39. Duct height for 8-22 May 1972 at Key West.  | 56          |
| 40. Path loss for low X-band antenna (solid curve) and duct height (asterisks).                     | 57          |
| 41. Path loss for low X-band antenna (solid curve) and wind speed (asterisks).                      | 58          |
| 42. Duct height for August 1970-October 1971 using 1000 hours observations.                         | 59          |
| 43. Duct height for August 1970-October 1971 using daily averages.                                  | 60          |

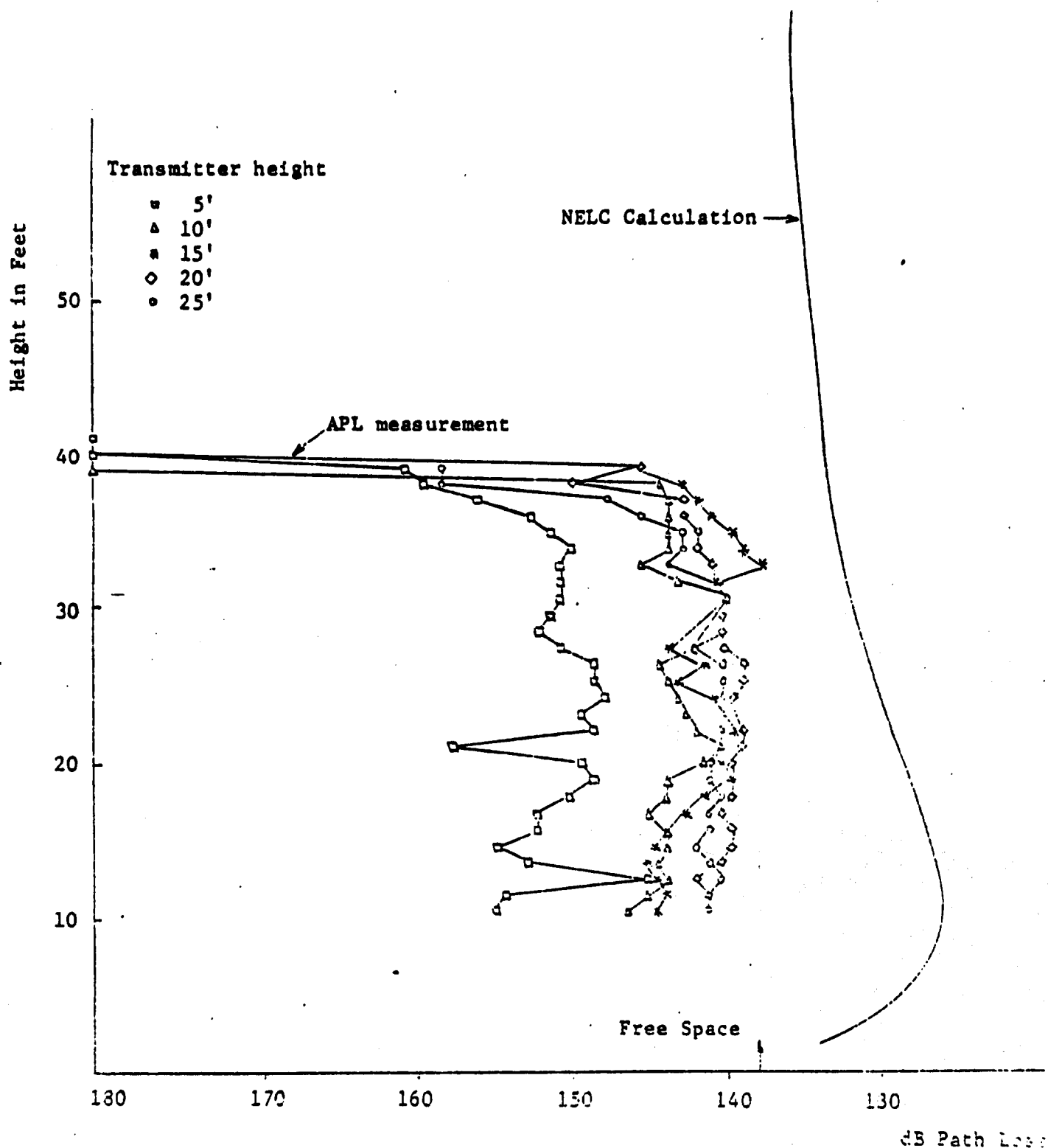


Figure 1. Measured and calculated path loss versus height profiles. The measured profiles were obtained at Key West at 5.85 GHz over a 17 n mi path for transmitter heights from 5'-25' and are averaged over days. (From reference 2, figure 41) The calculated profile is based on the refractivity profile of figure 2 and a transmitter height of five feet.

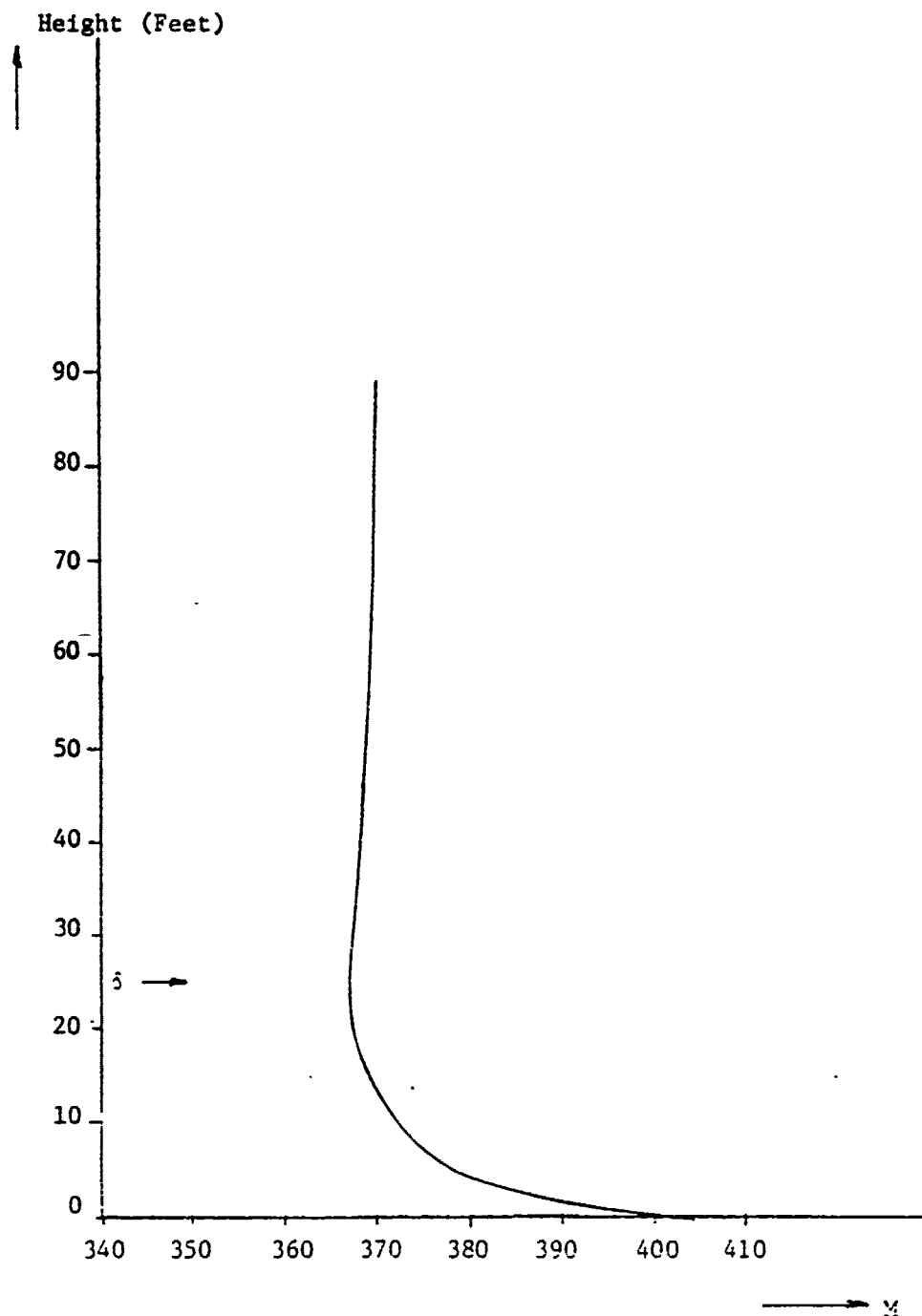


Figure 2. Refractivity profile used to calculate the path loss versus height profile of figure 1 (from figure 167 reference 2).

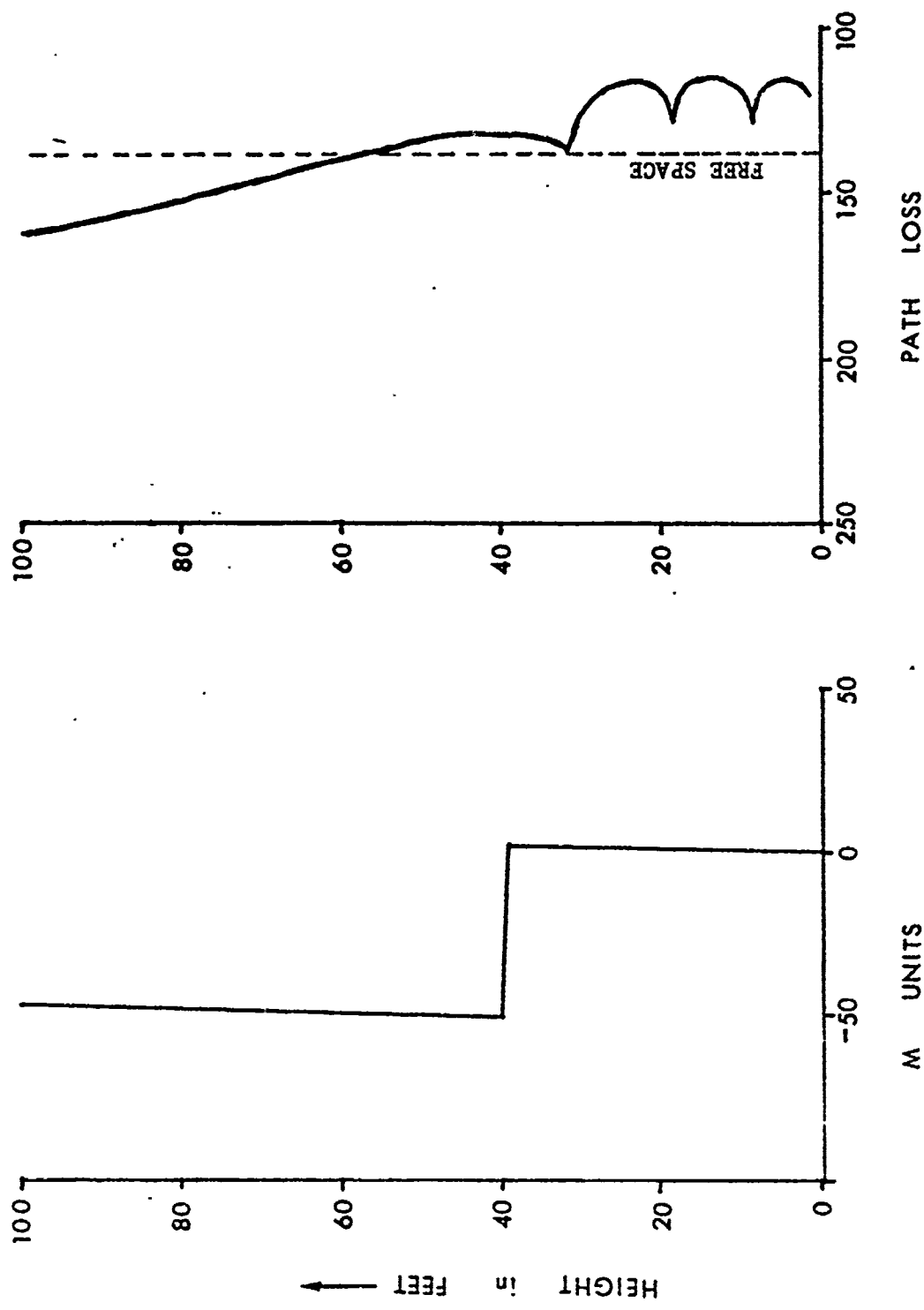


Figure 3. Fictitious M-profile with 50 M-unit change between 39' and 40' and corresponding path loss versus height profile.

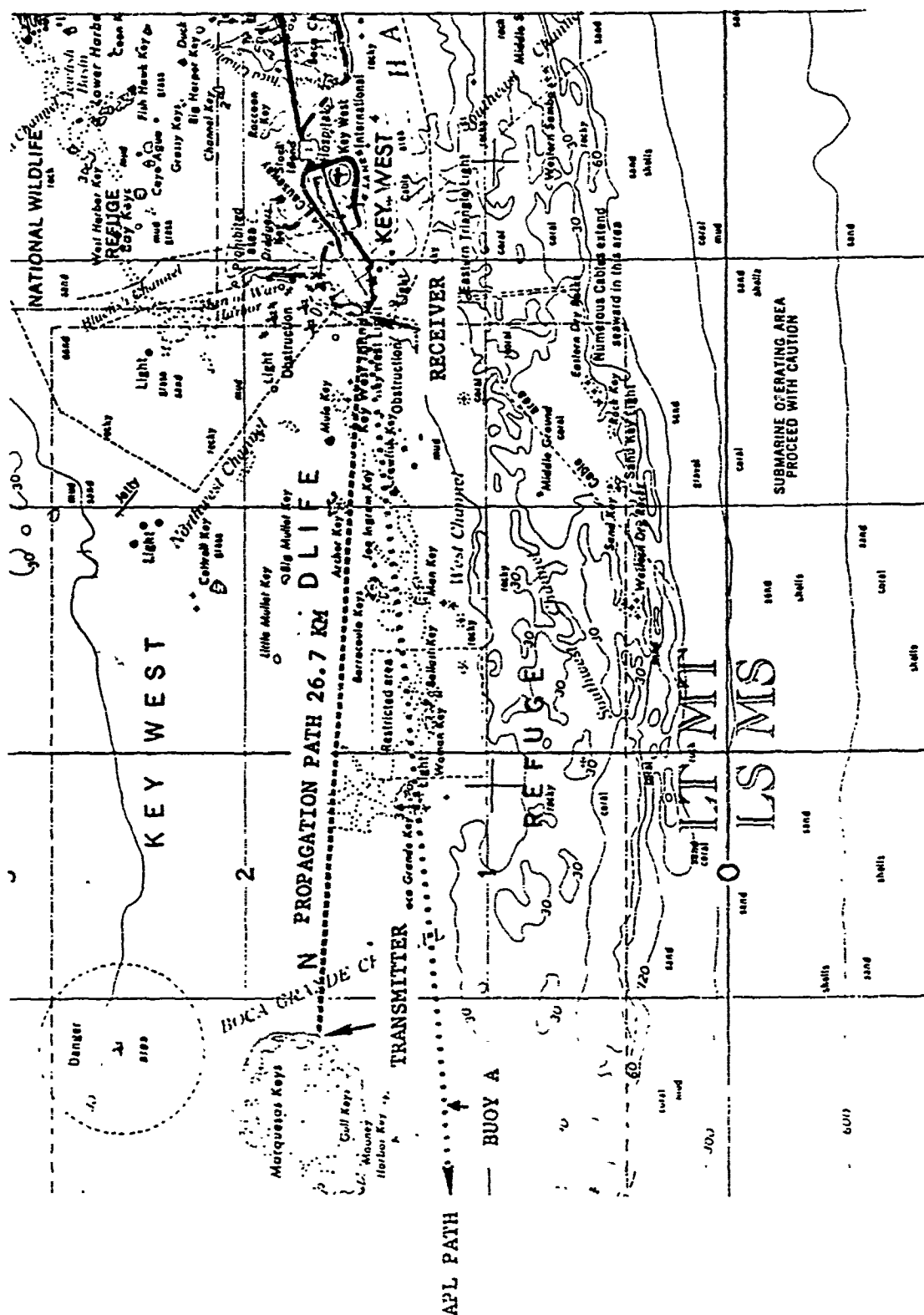


Figure 4. Geographic location of propagation path.

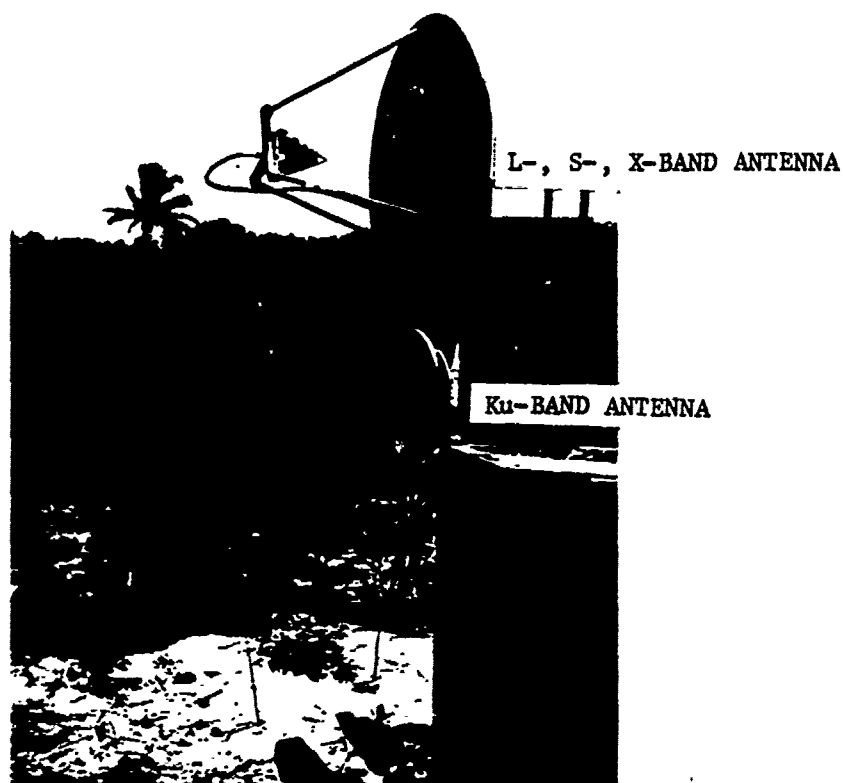


Figure 5. Transmitter on the Marquesa Keys

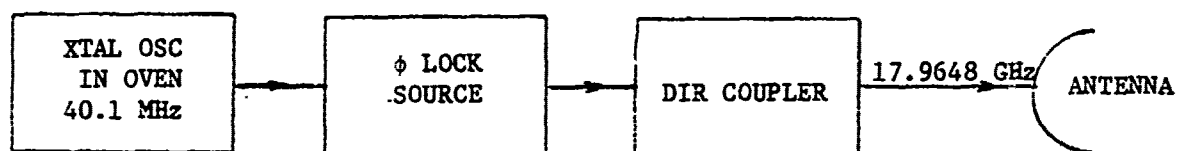


Figure 6. Block diagram of Ku-band transmitter.

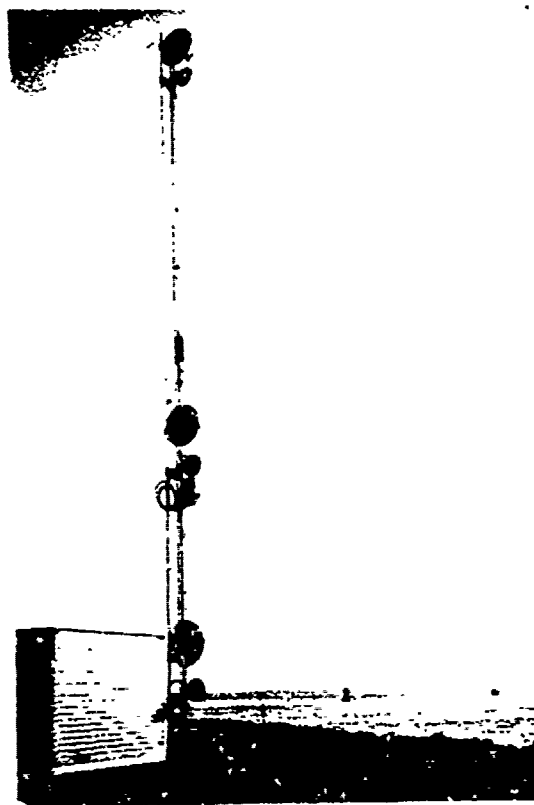


Figure 7. Receiving mast at the Key West Naval Station.

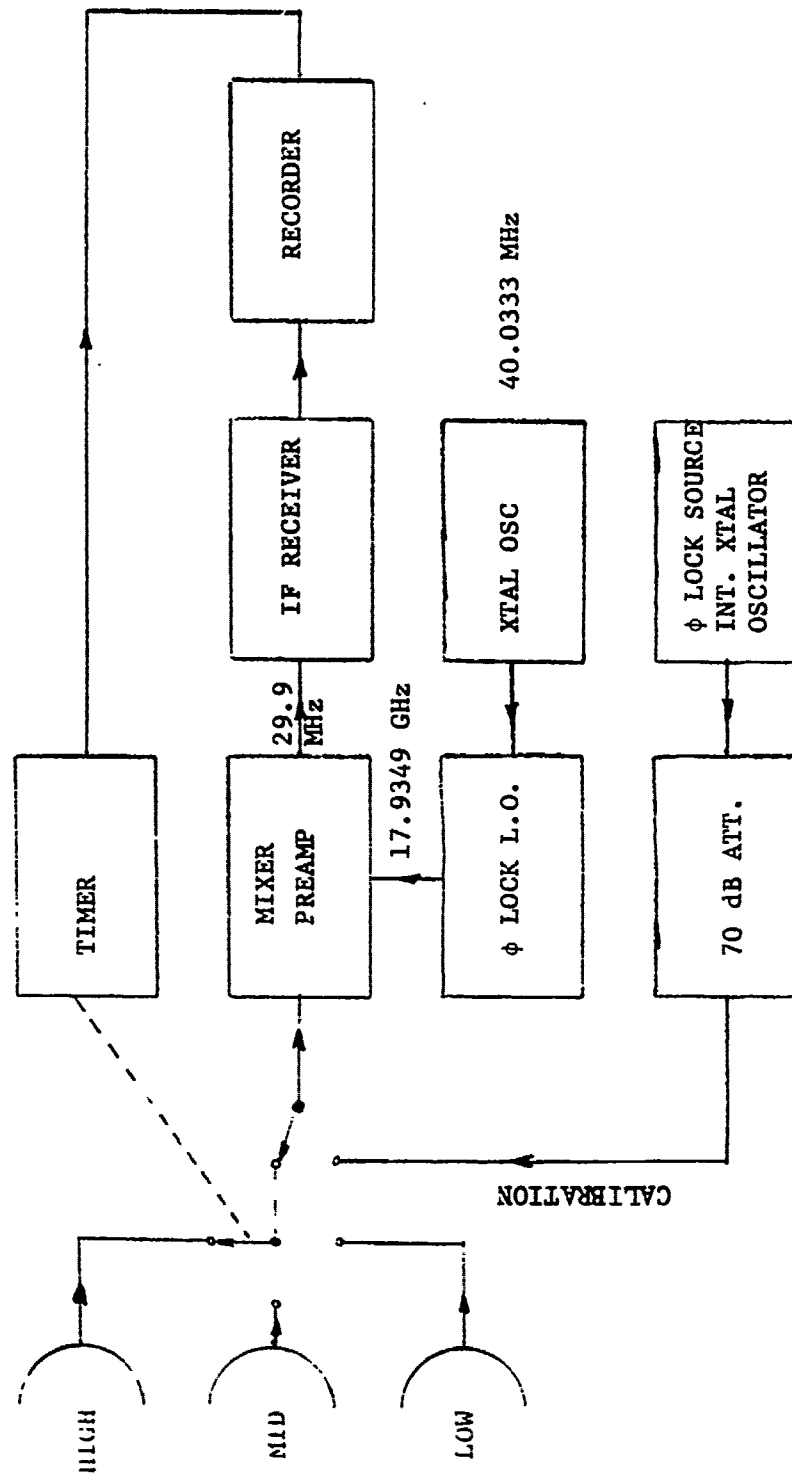
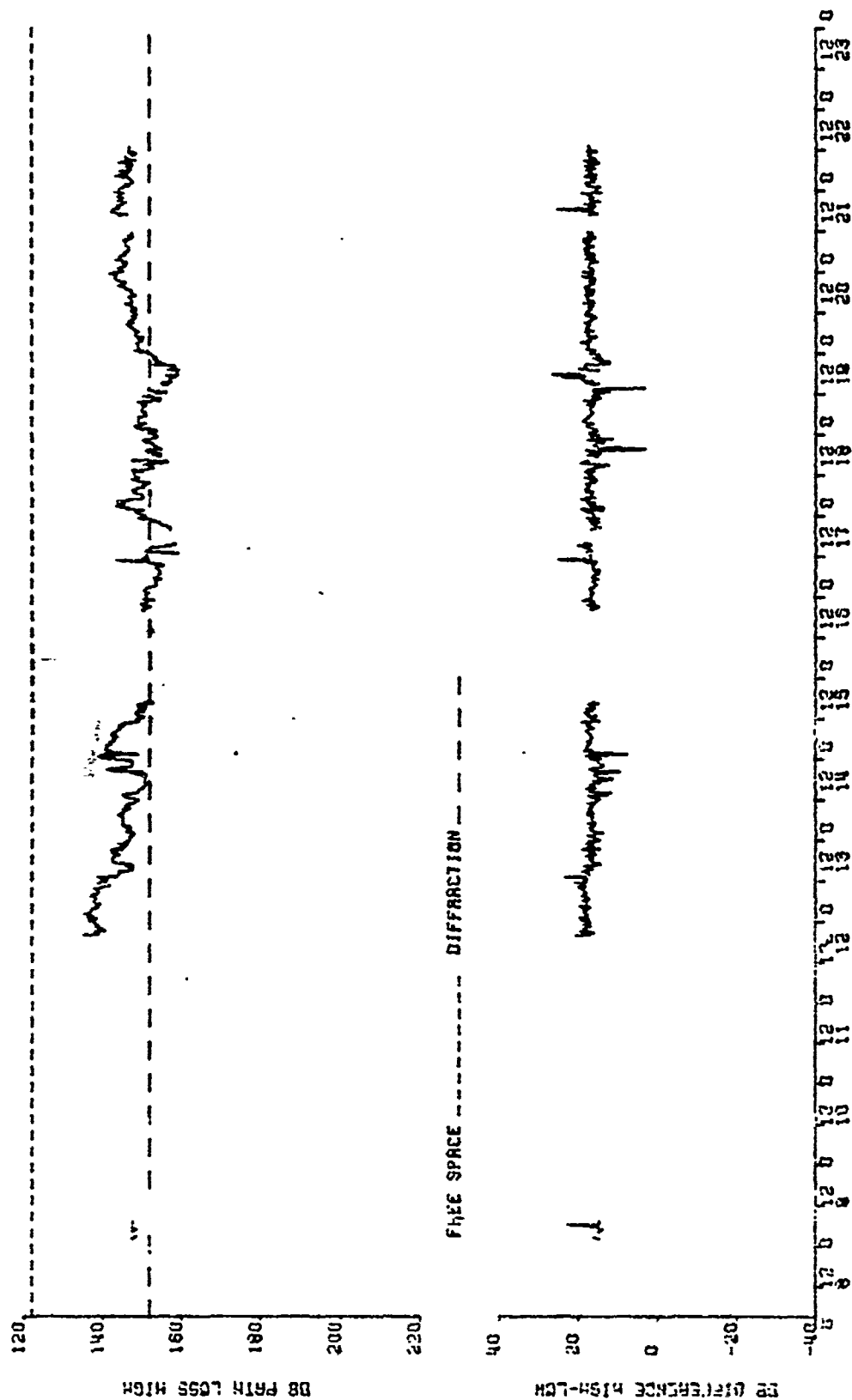
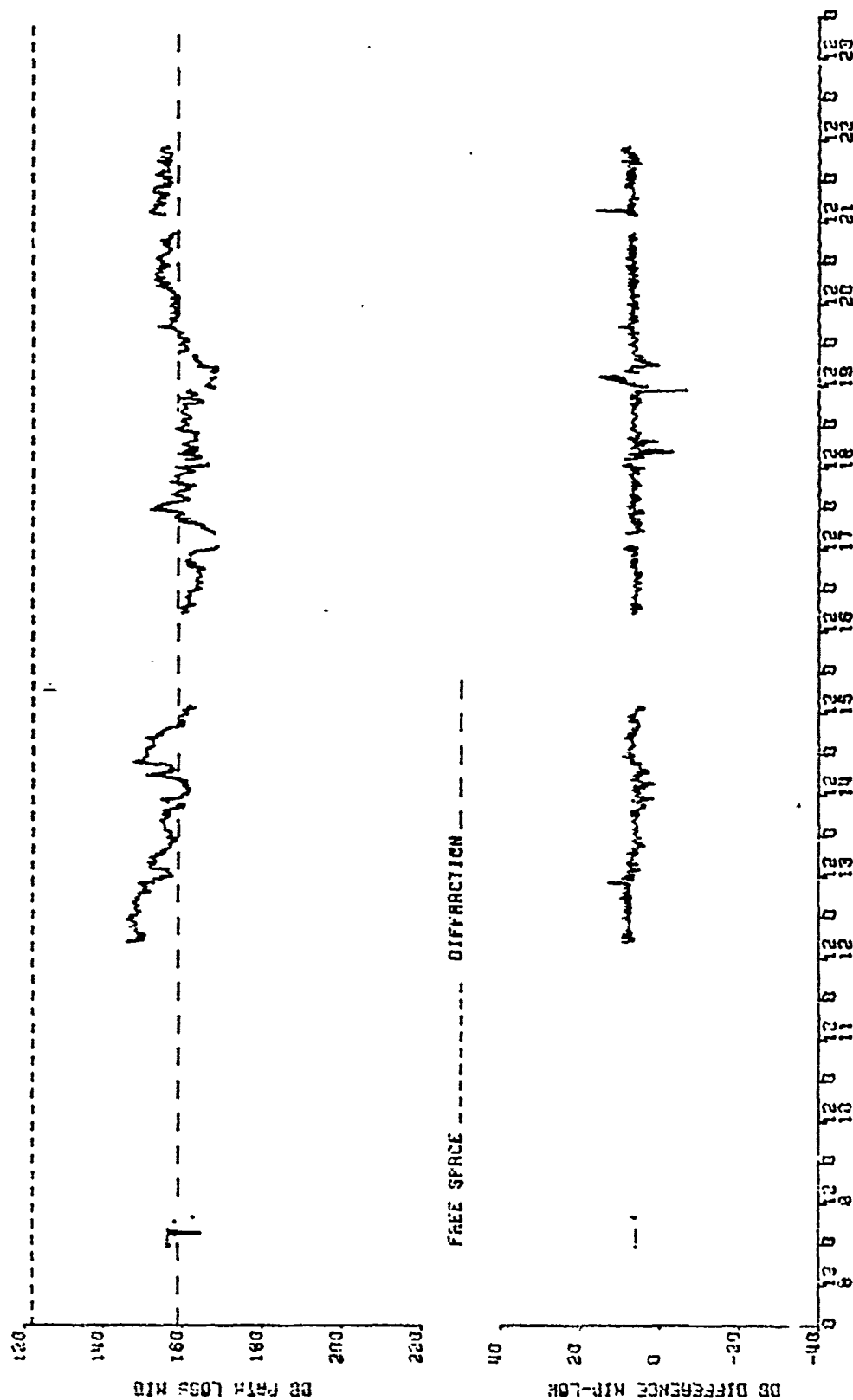


Figure 8. Block diagram of Ku-band receiver.



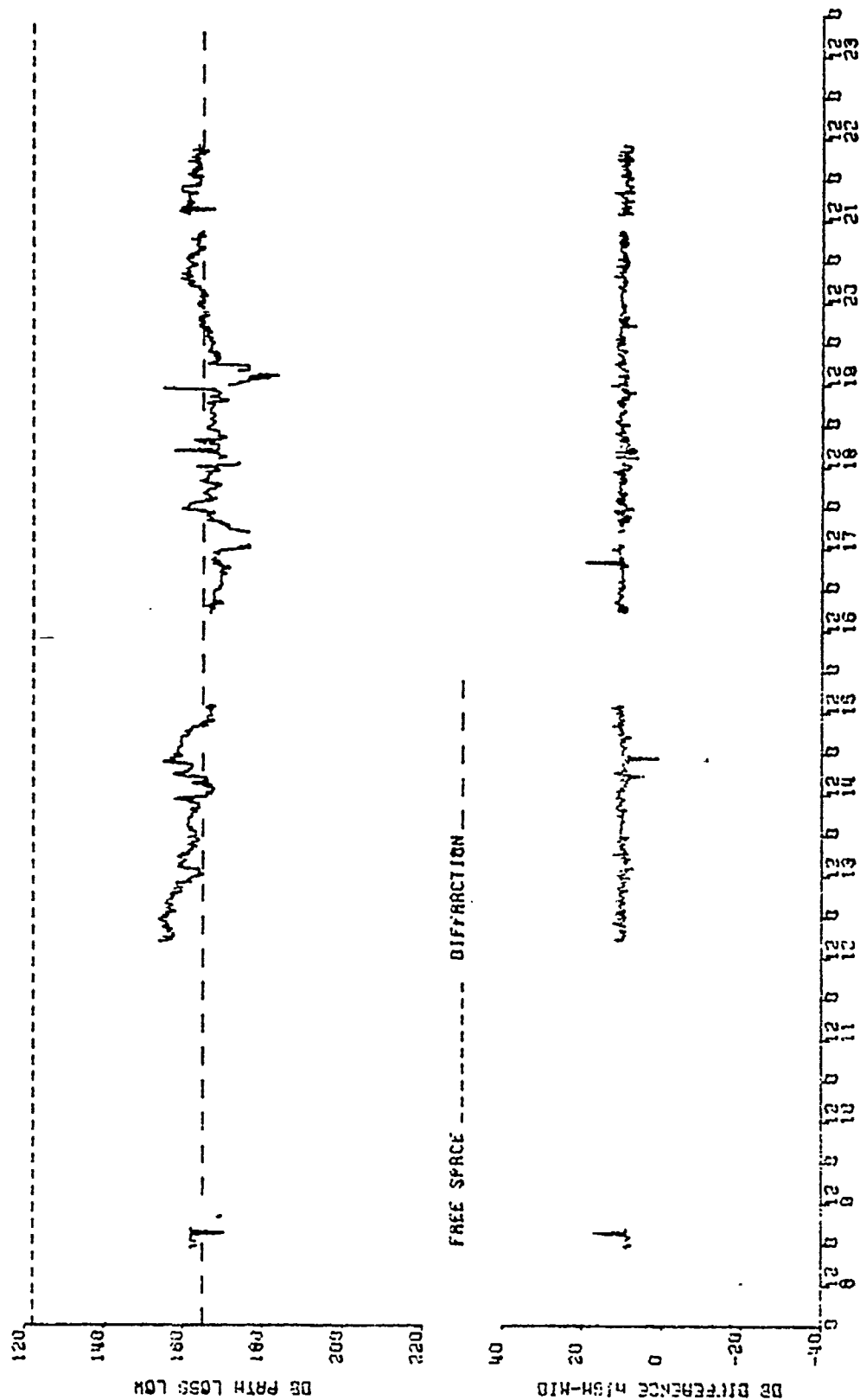
L BAND MARQUESAS TO KEY WEST, FLORIDA MAY, 1972

Figure 9. Path loss for high L-band antenna and path loss difference high-low antenna.



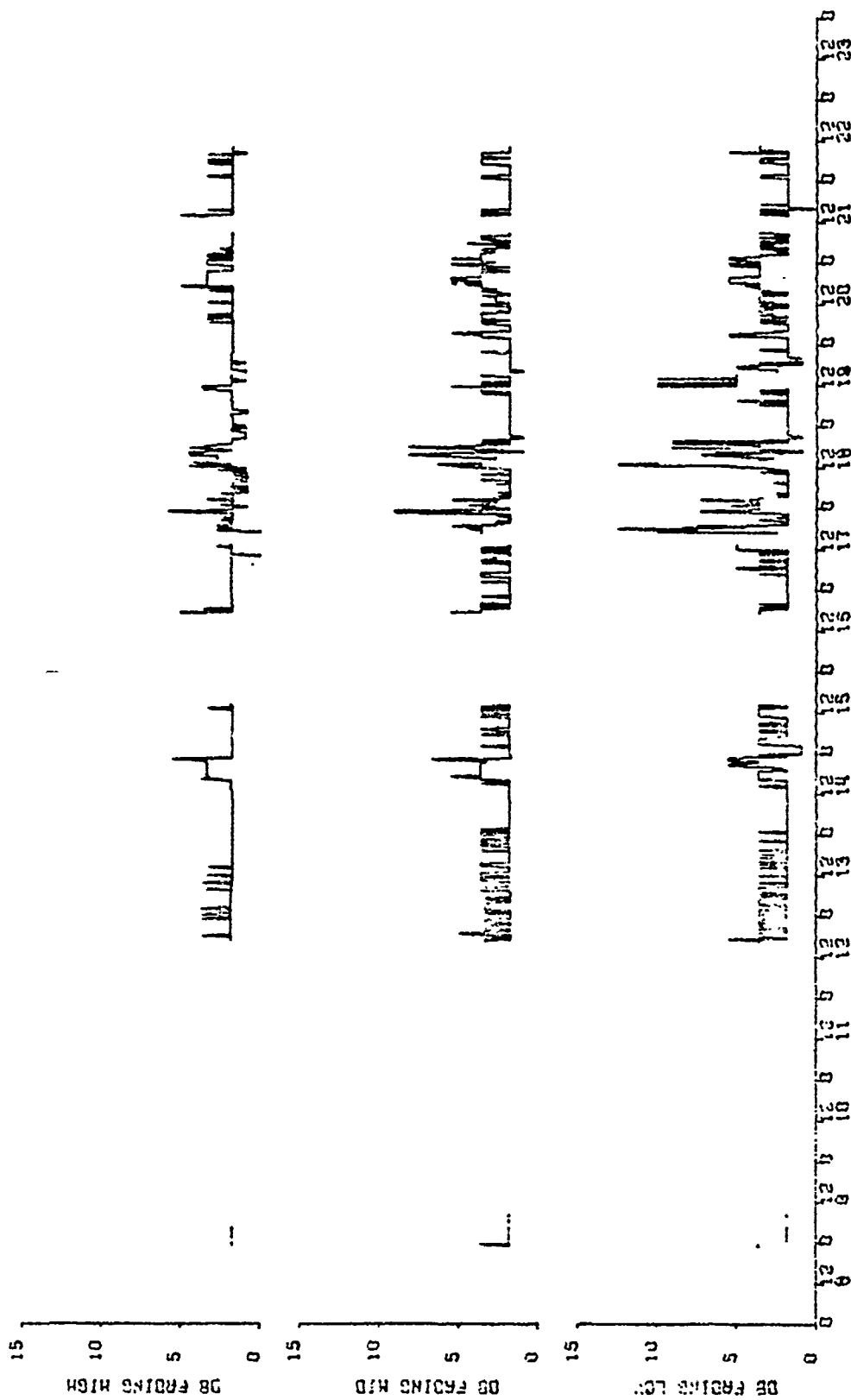
L BAND WAVELENGTHS TO KEY WEST, FLORIDA MAY, 1972

Figure 10. Path loss for middle L-band antenna and path loss difference mid-low antenna.



L BAND NARQUESAS TO KEY WEST, FLORIDA MAY, 1972

Figure 11. Path loss for low L-band antenna and difference high-mid antenna.



L BAND ARQUESAS TO KEY WEST, FLORIDA MAY, 1972  
Figure 12. Fading L-band.

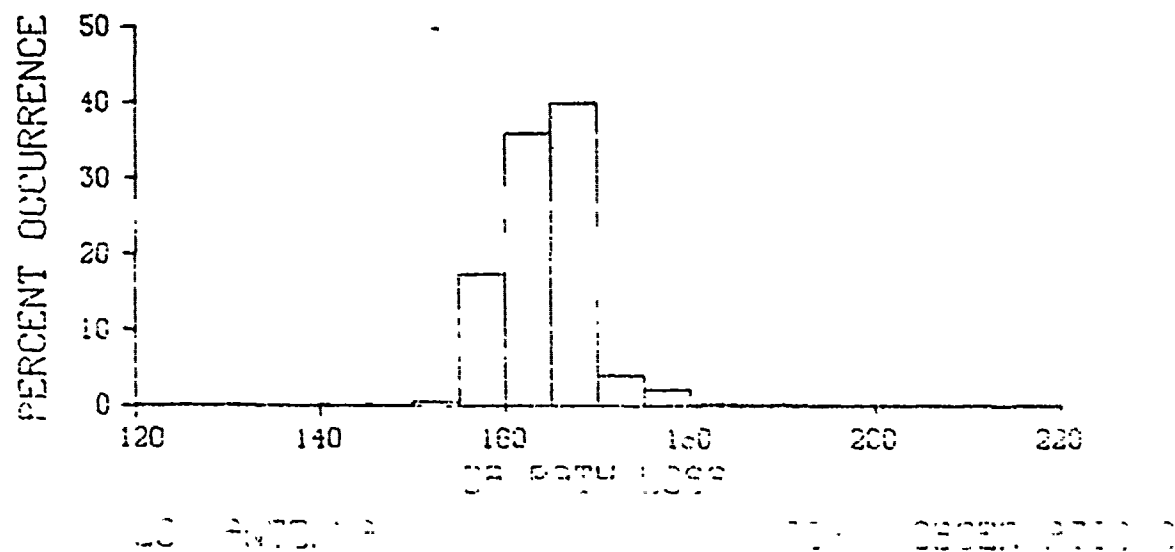
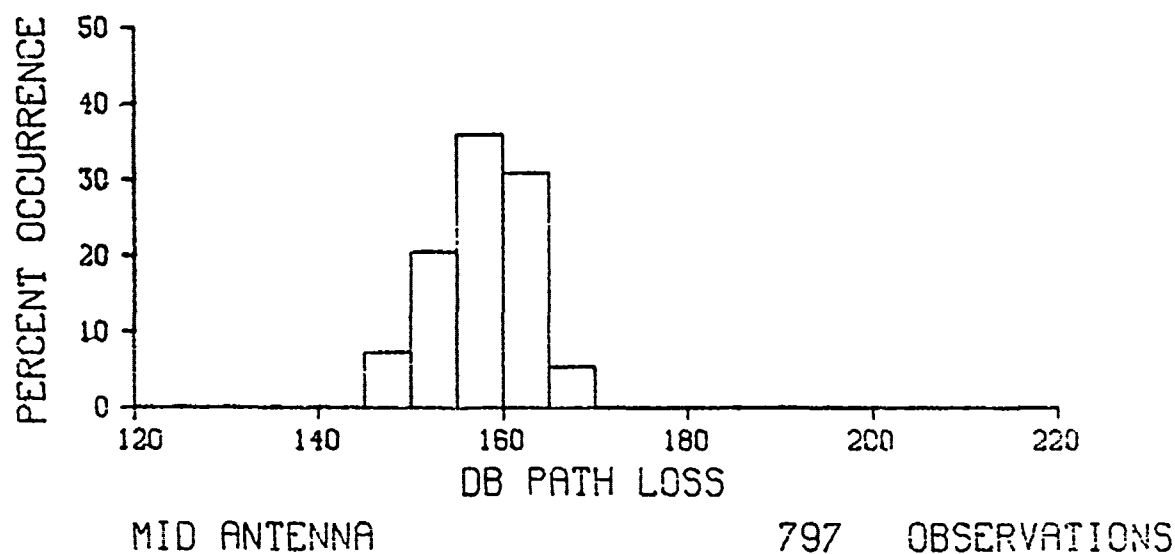
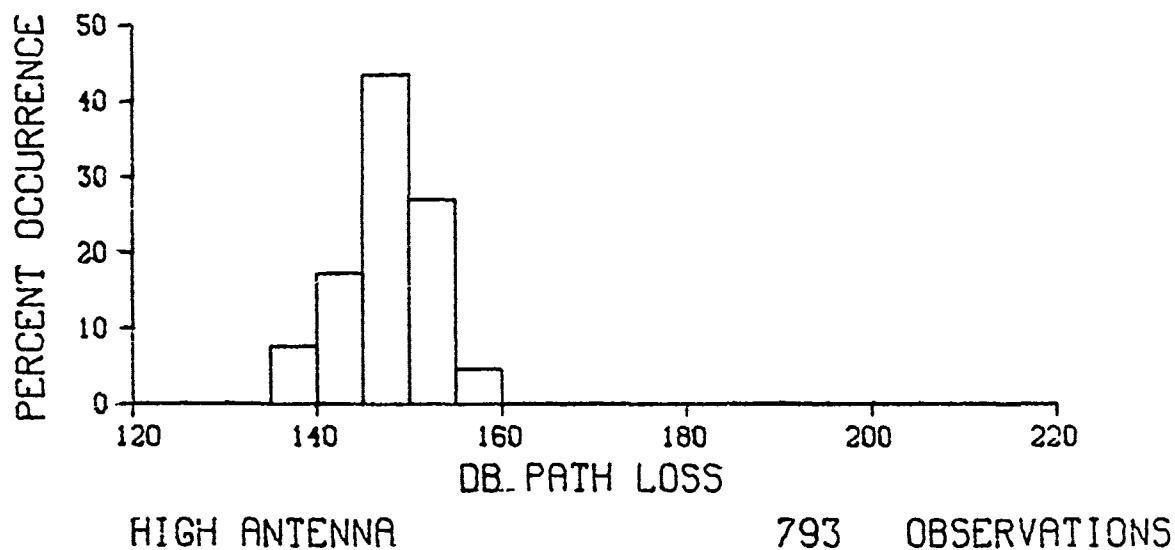


Figure 13. Frequency distributions of path loss for L-band.

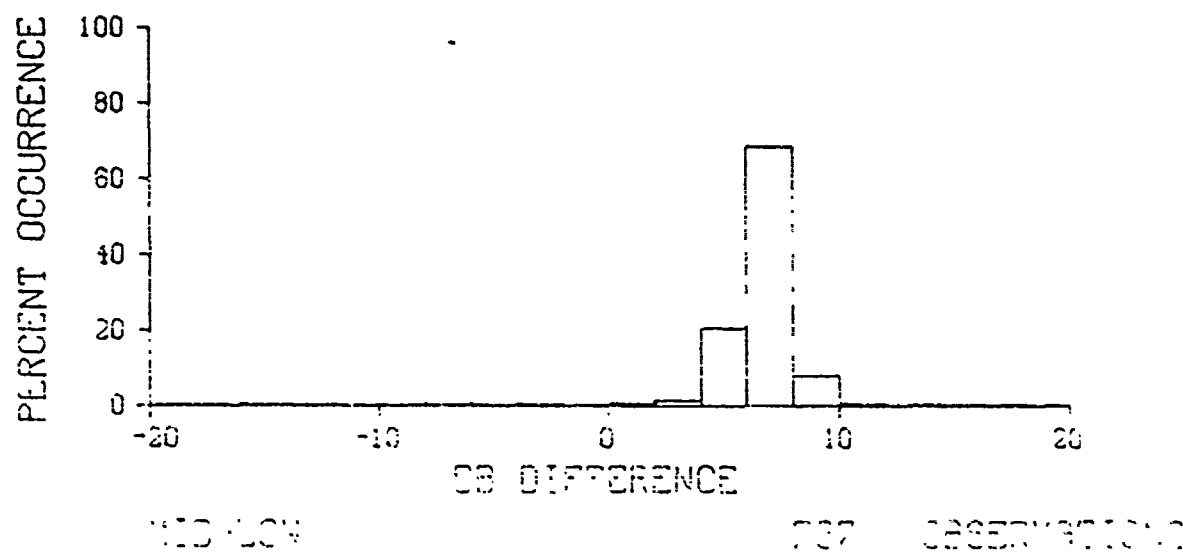
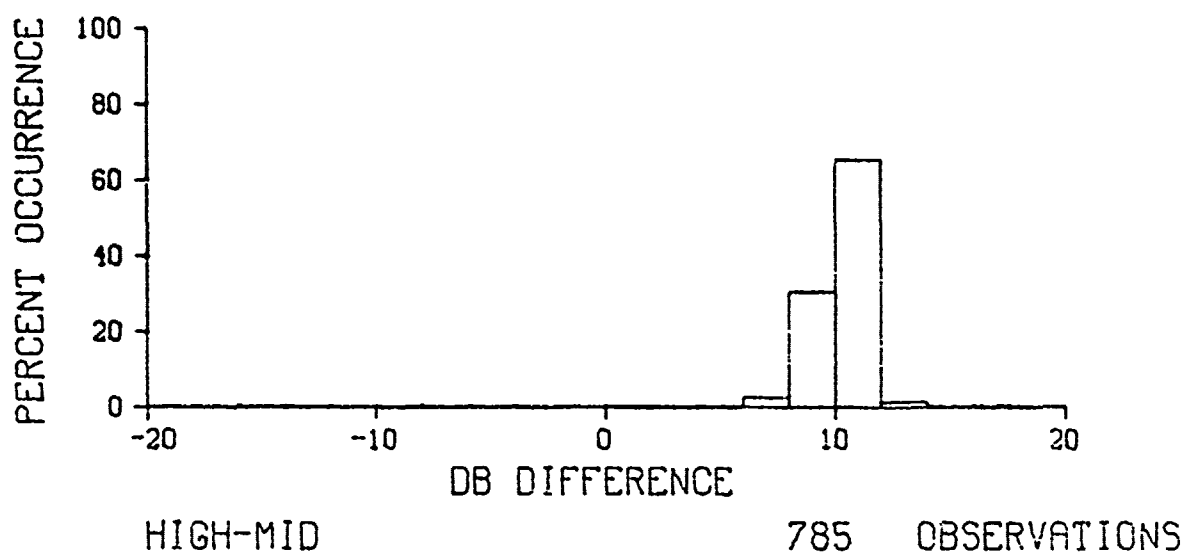
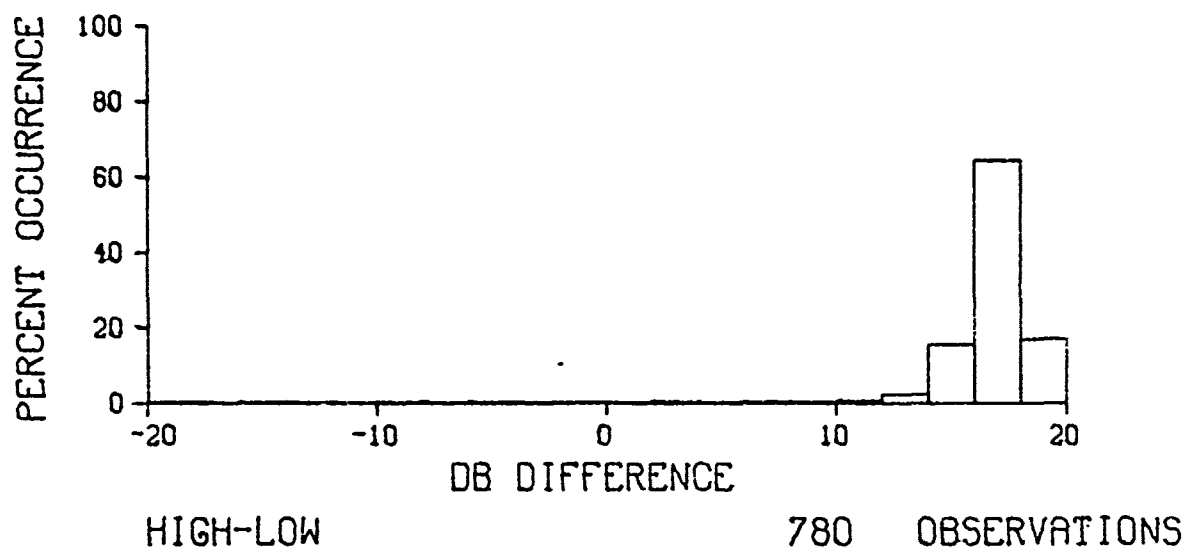


Figure 14. Frequency distributions of path loss differences between antenna for L-band.

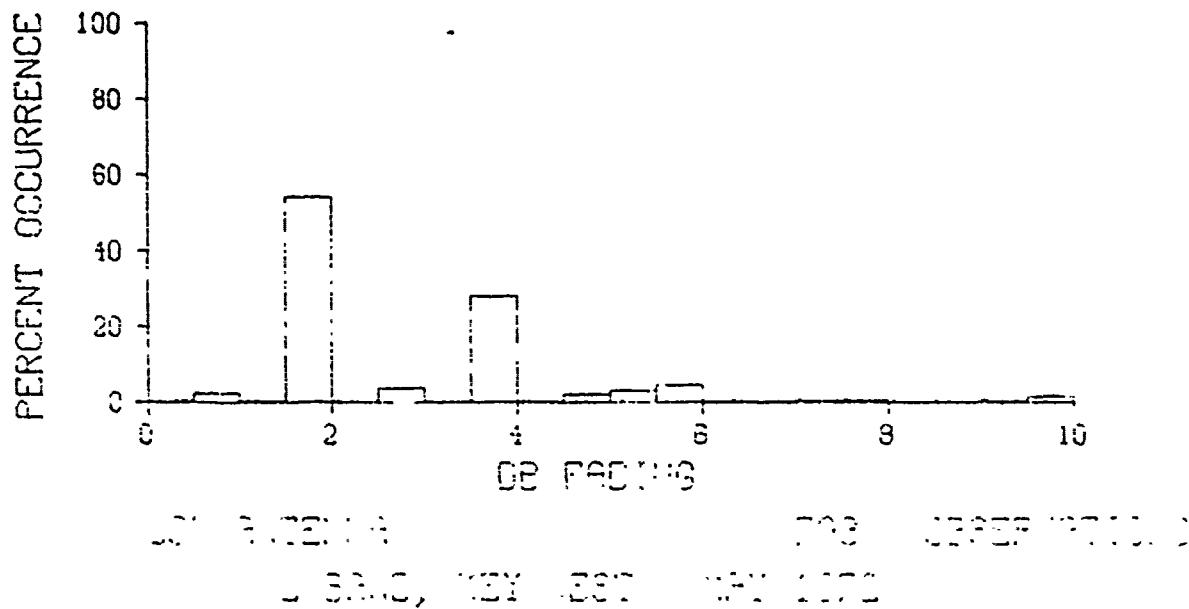
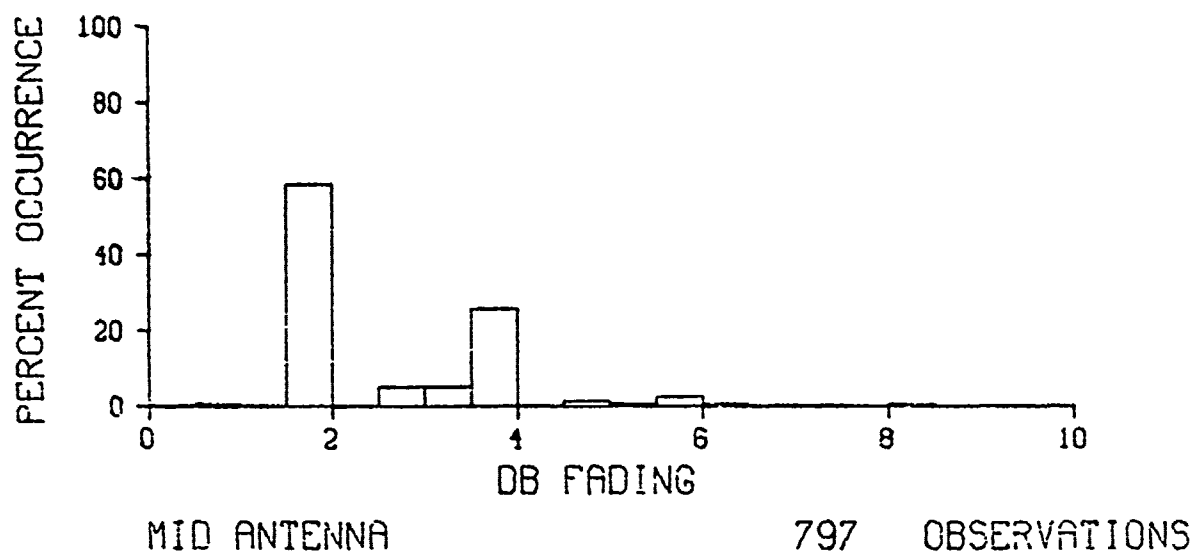
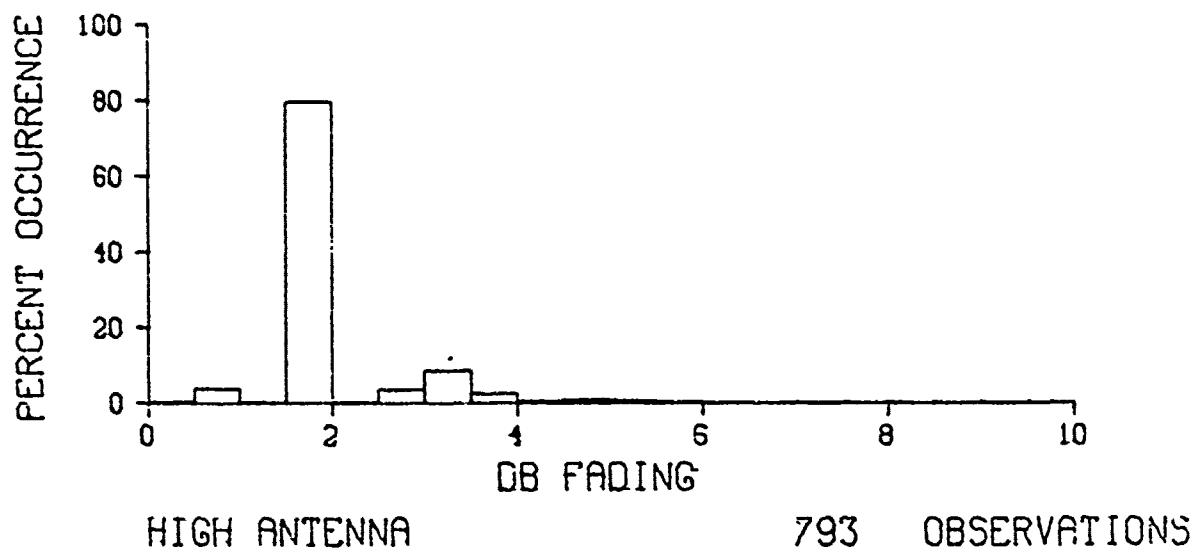


Figure 15. Frequency distribution of fading L-band.

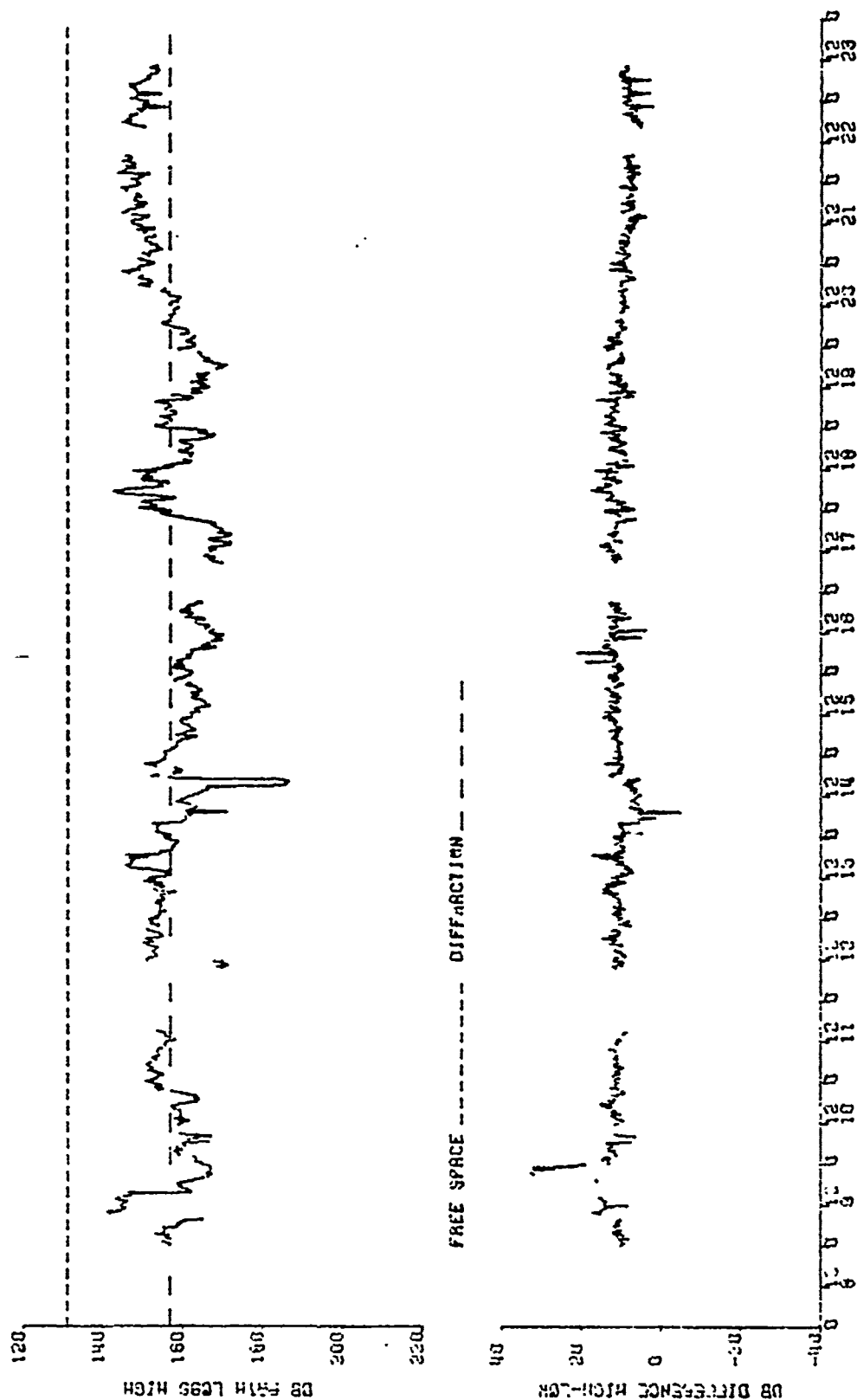
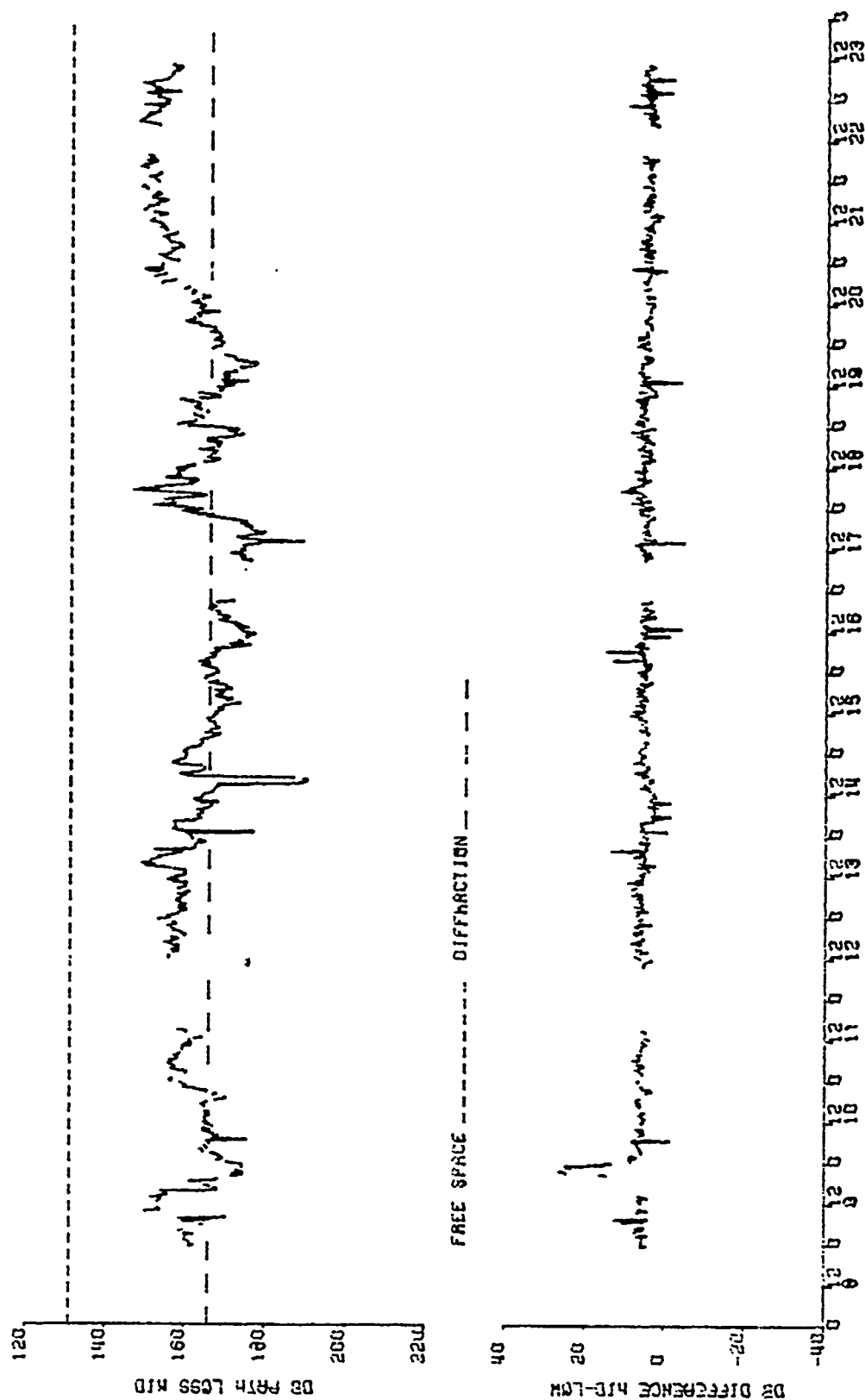


Figure 16. Path loss for high S-band antenna and path loss difference high-low antenna.



S BAND ANTENNA TO KEY WEST, FLORIDA MAY, 1972

Figure 17. Path loss for middle S-band antenna and path loss difference mid-low antenna.

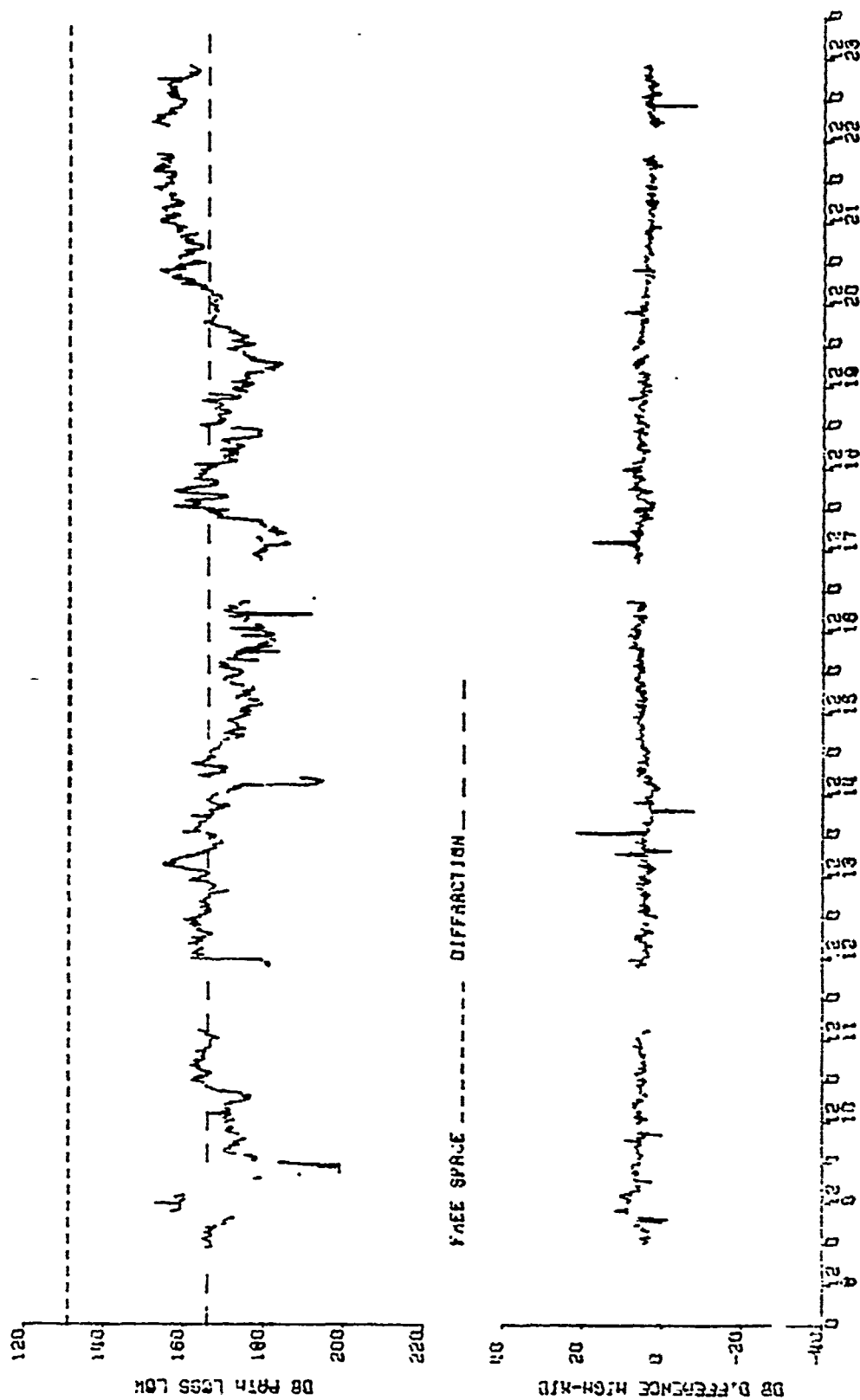
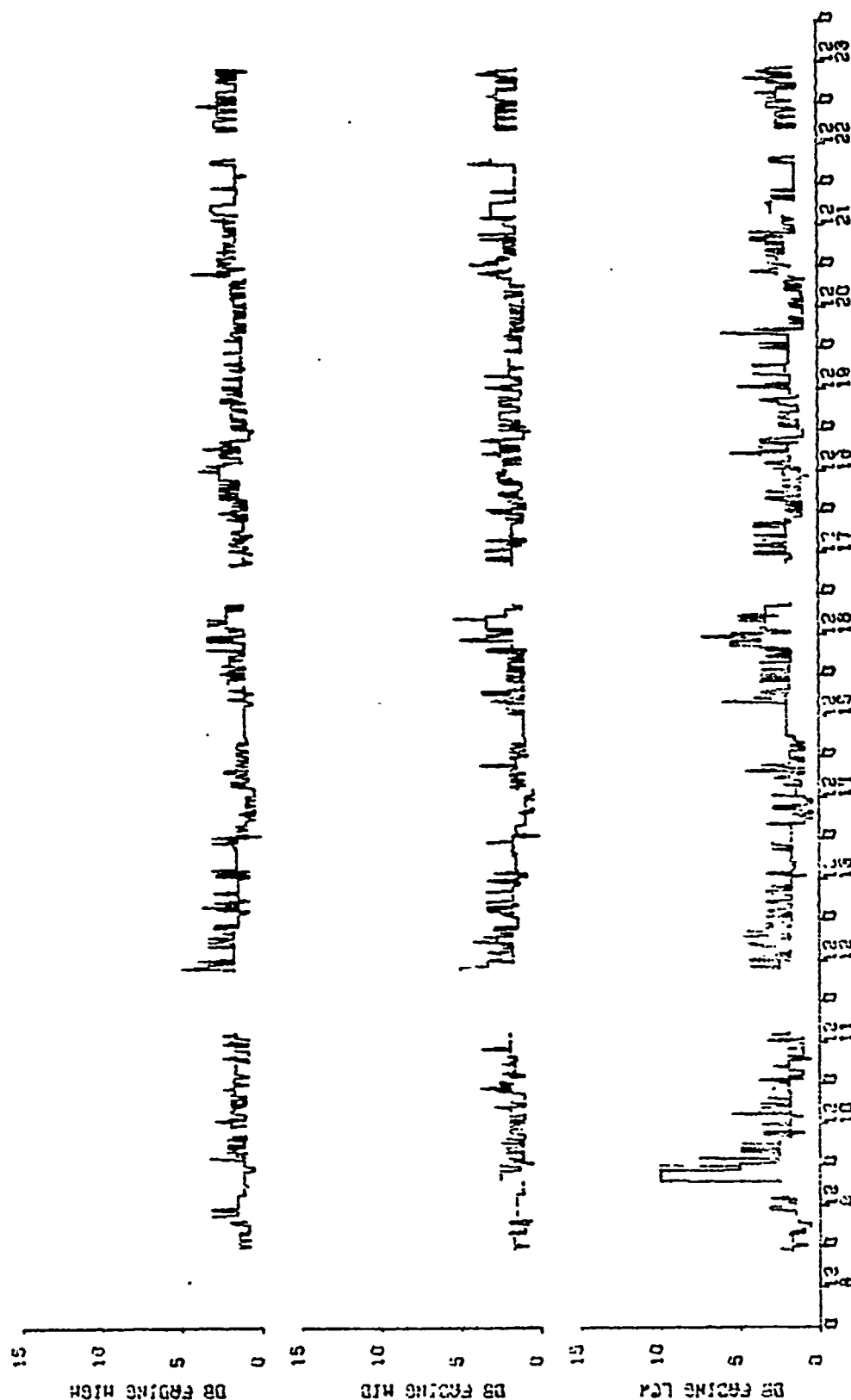


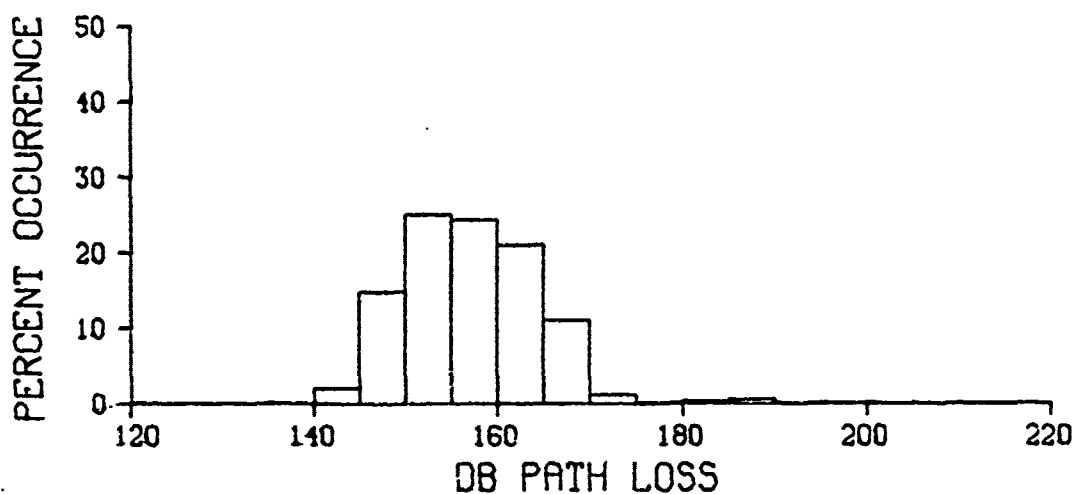
Figure 18. Path loss for low S-band antenna and path loss difference high-mid antenna.

S BAND ANTENNAS TO KEY WEST, FLORIDA MAY, 1972



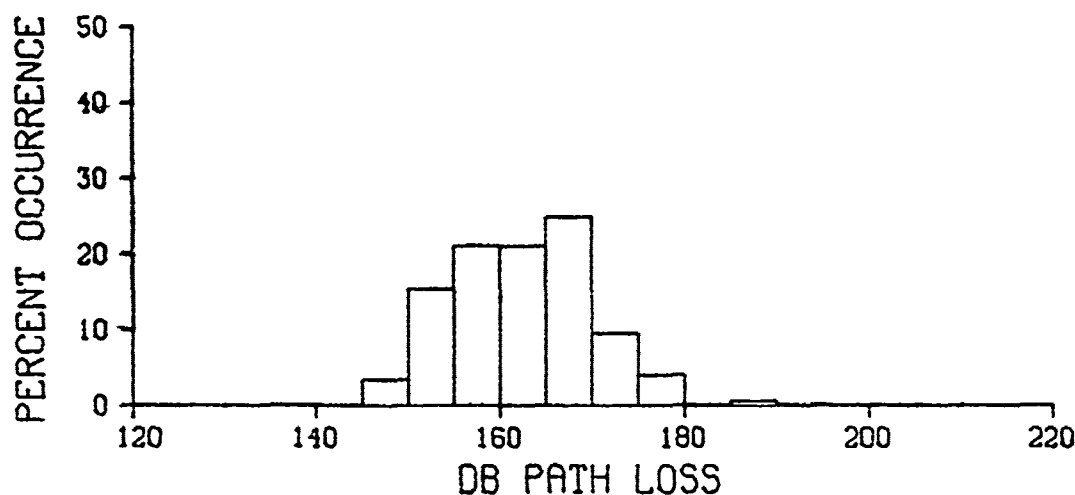
S BAND MEASUREMENTS TO KEY WEST, FLORIDA MAY, 1972

Figure 19. Fading S-band.



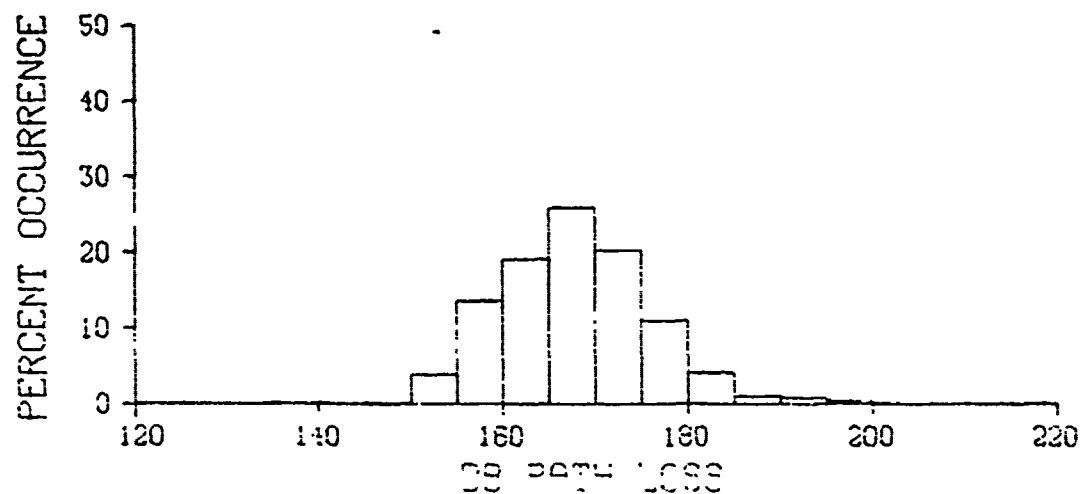
HIGH ANTENNA

1116 OBSERVATIONS



MID ANTENNA

1080 OBSERVATIONS



LOW ANTENNA

1080 OBSERVATIONS

S-BAND 1000 WATT 40 1972

40 1972

Figure 20. Frequency distributions of path loss for S-band.

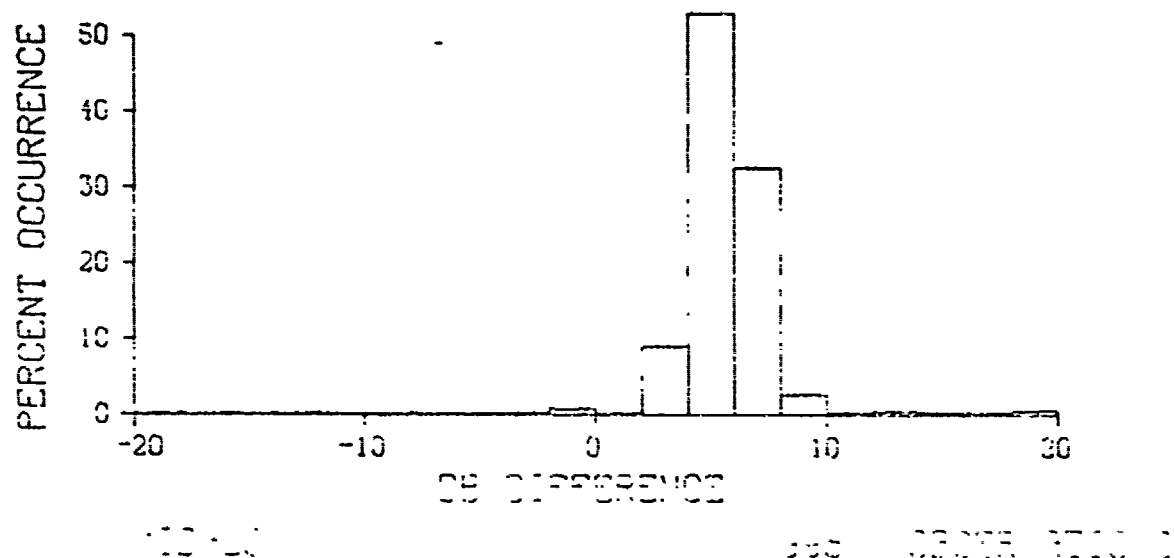
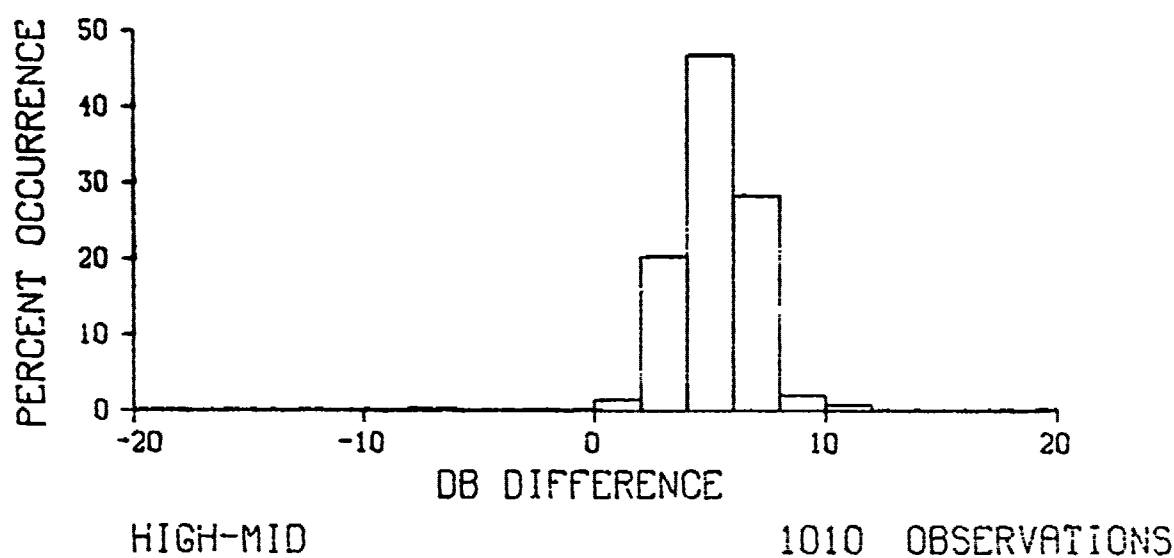
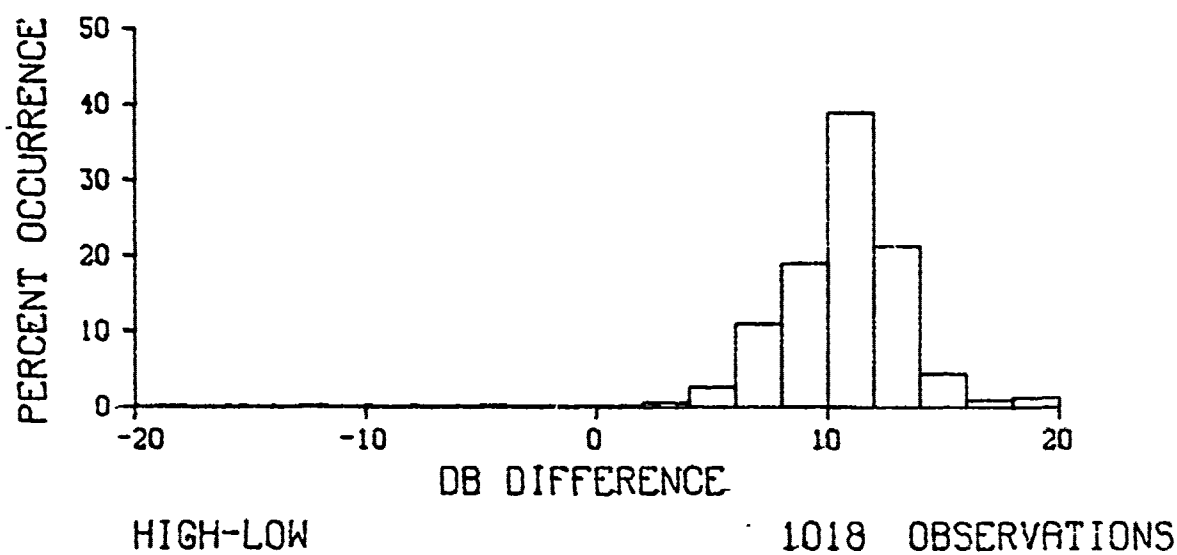


Figure 21. Frequency distributions of path loss differences between antennas for S-band.

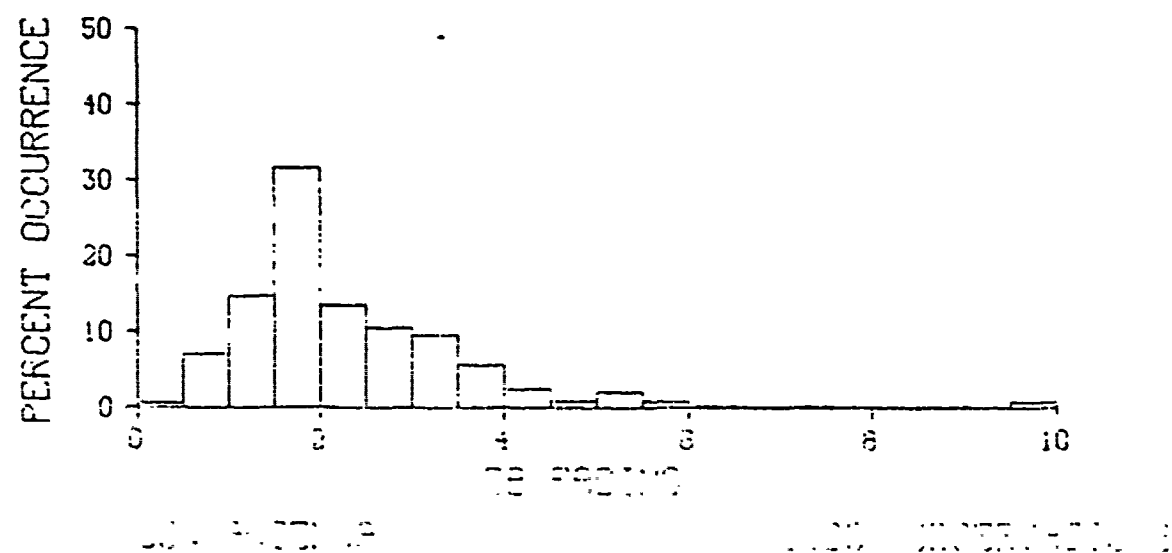
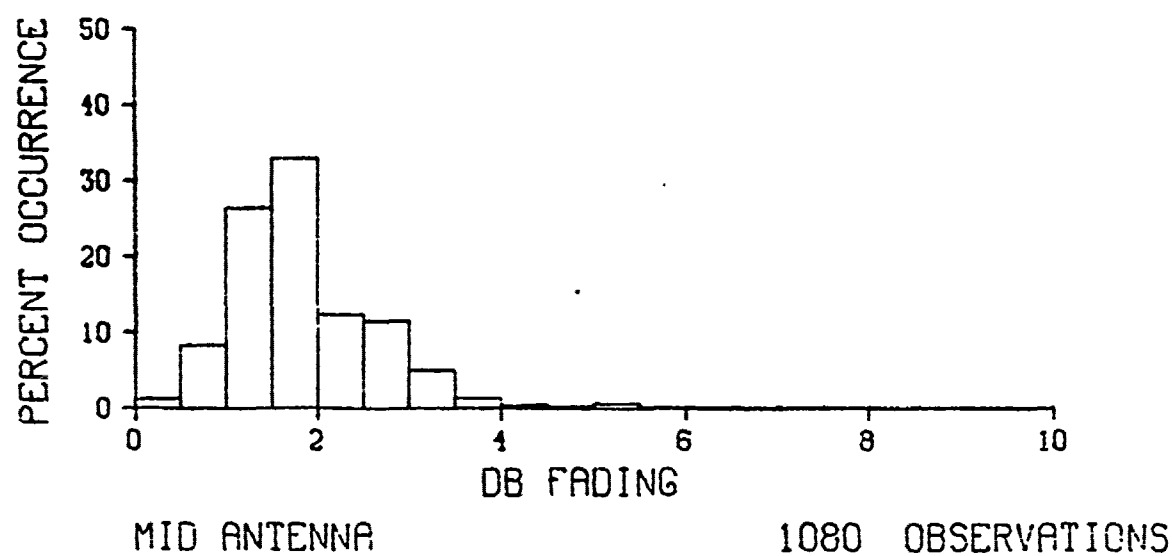
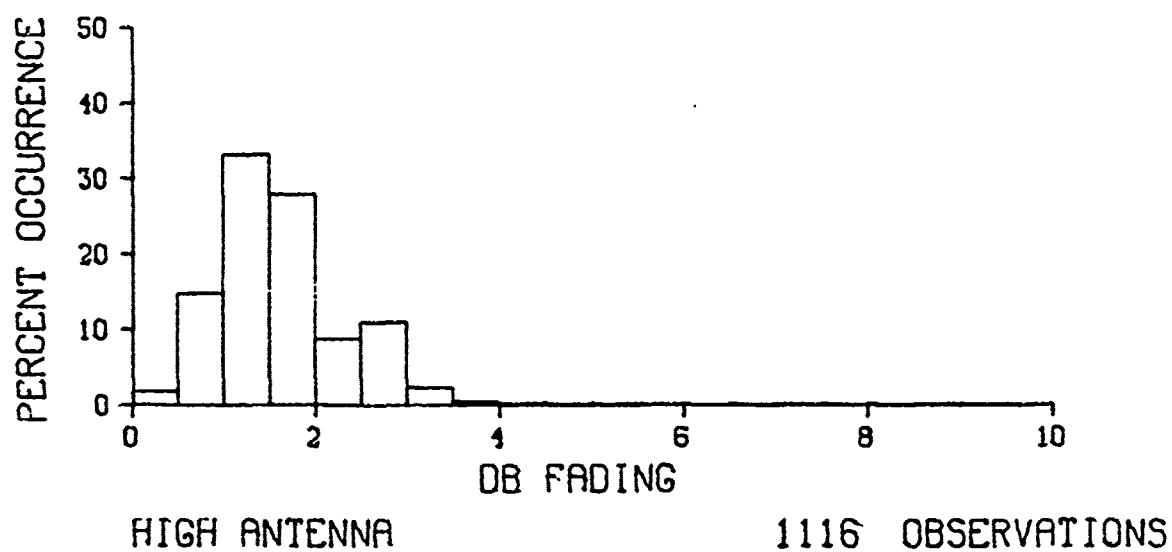


Figure 22. Frequency distributions of fading for S-band.

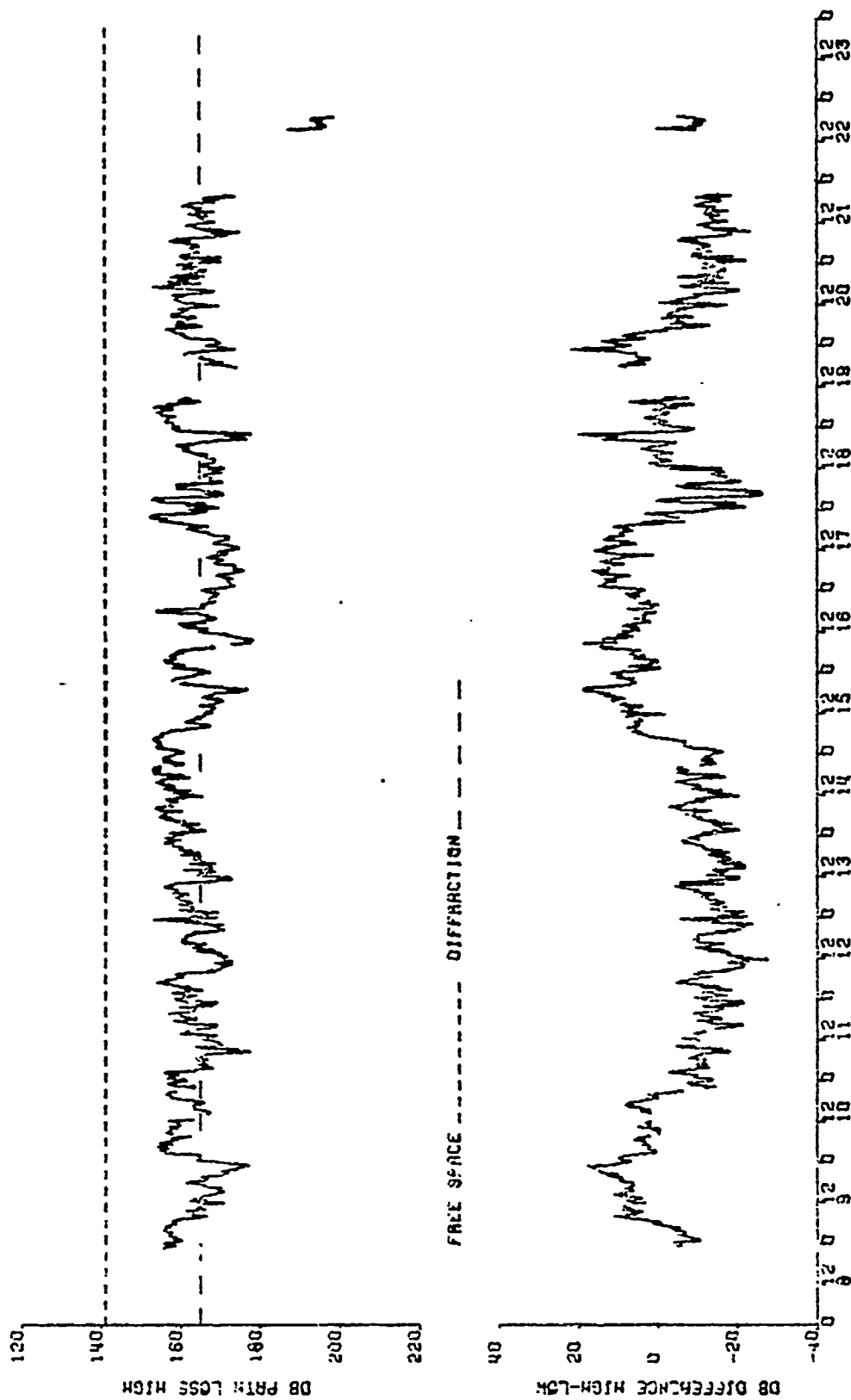
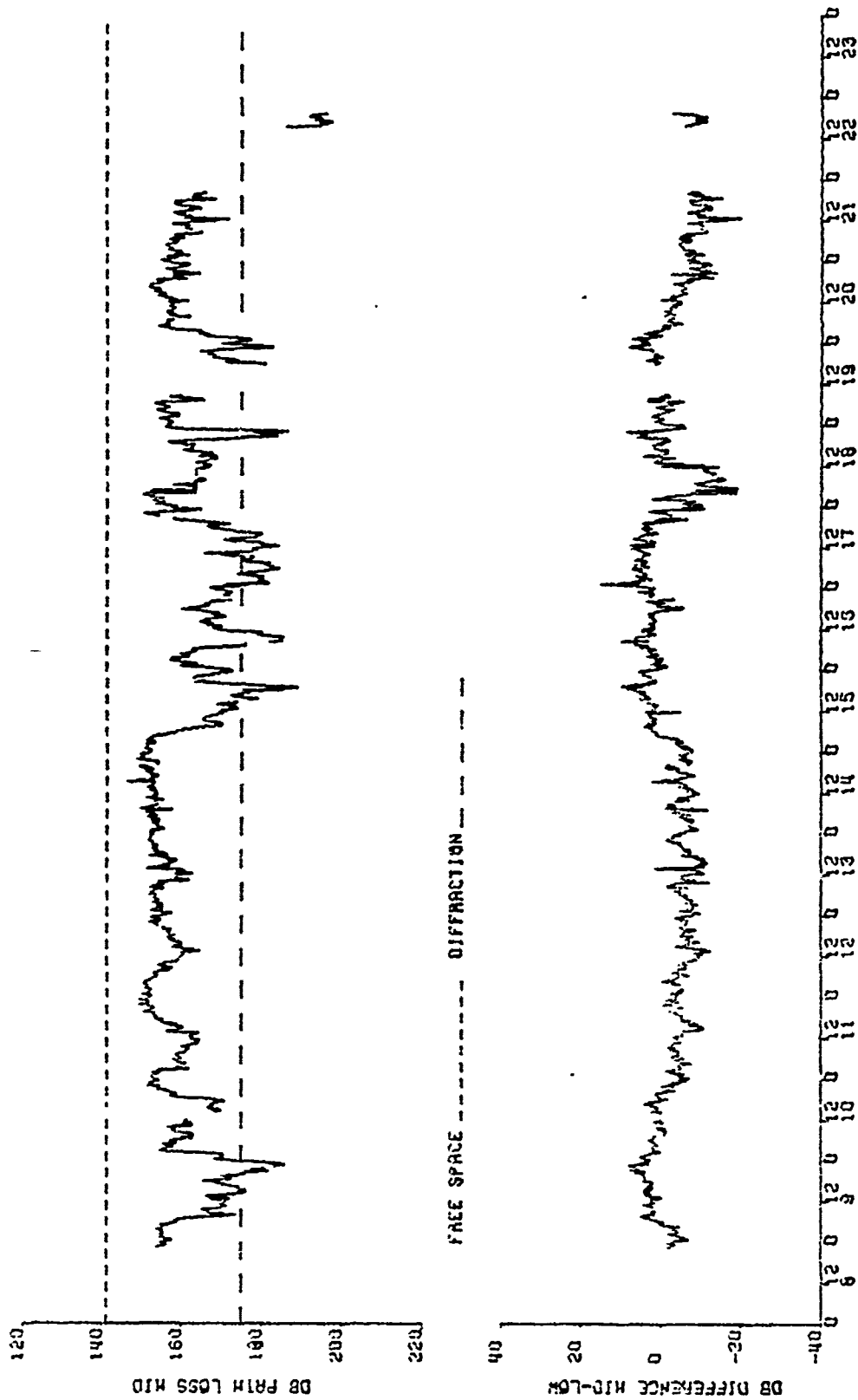


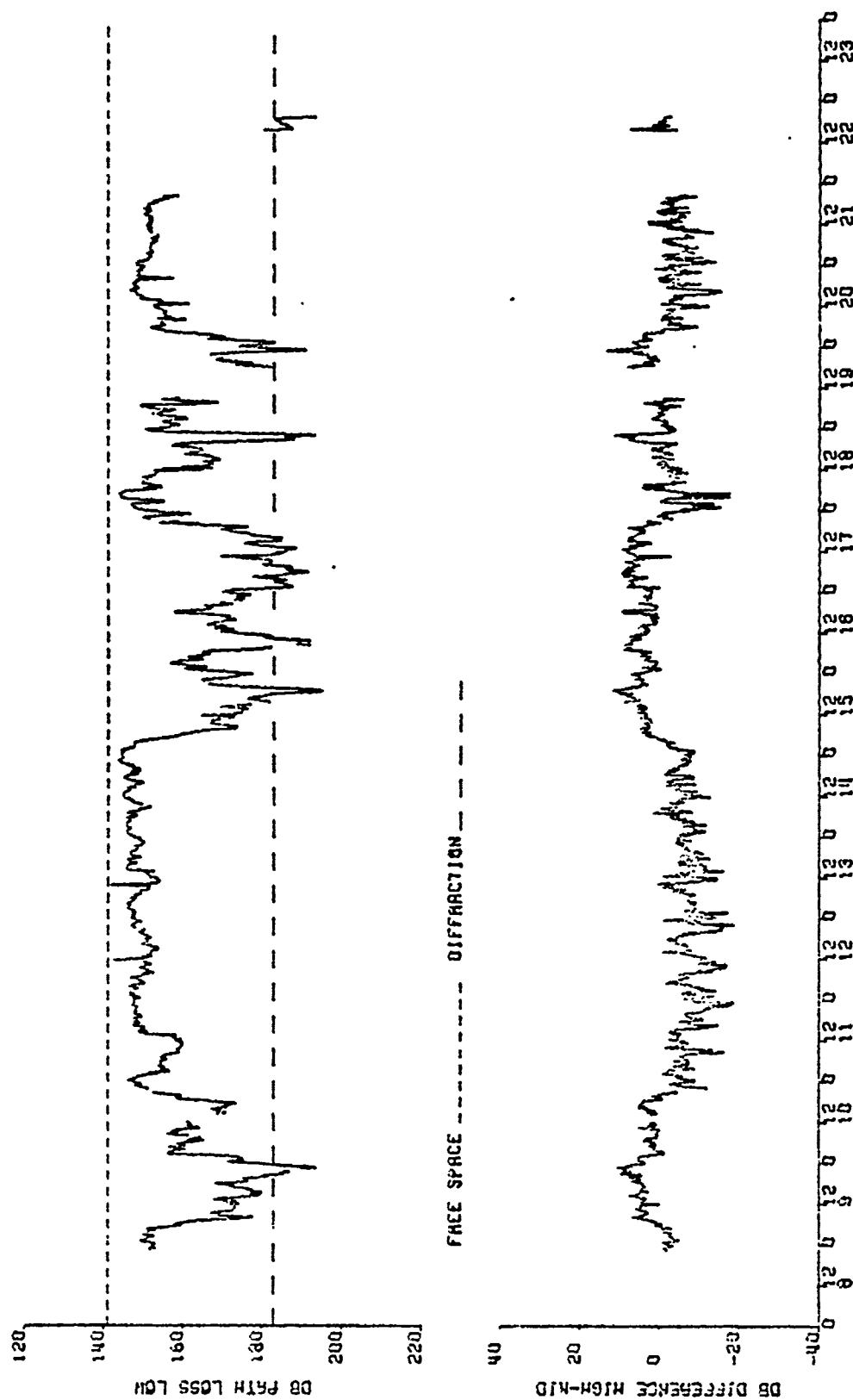
Figure 23. Path loss for high X-band antenna and path loss difference high-low antenna.

X BAND MARQUESS TO KEY WEST, FLORIDA MAY, 1972



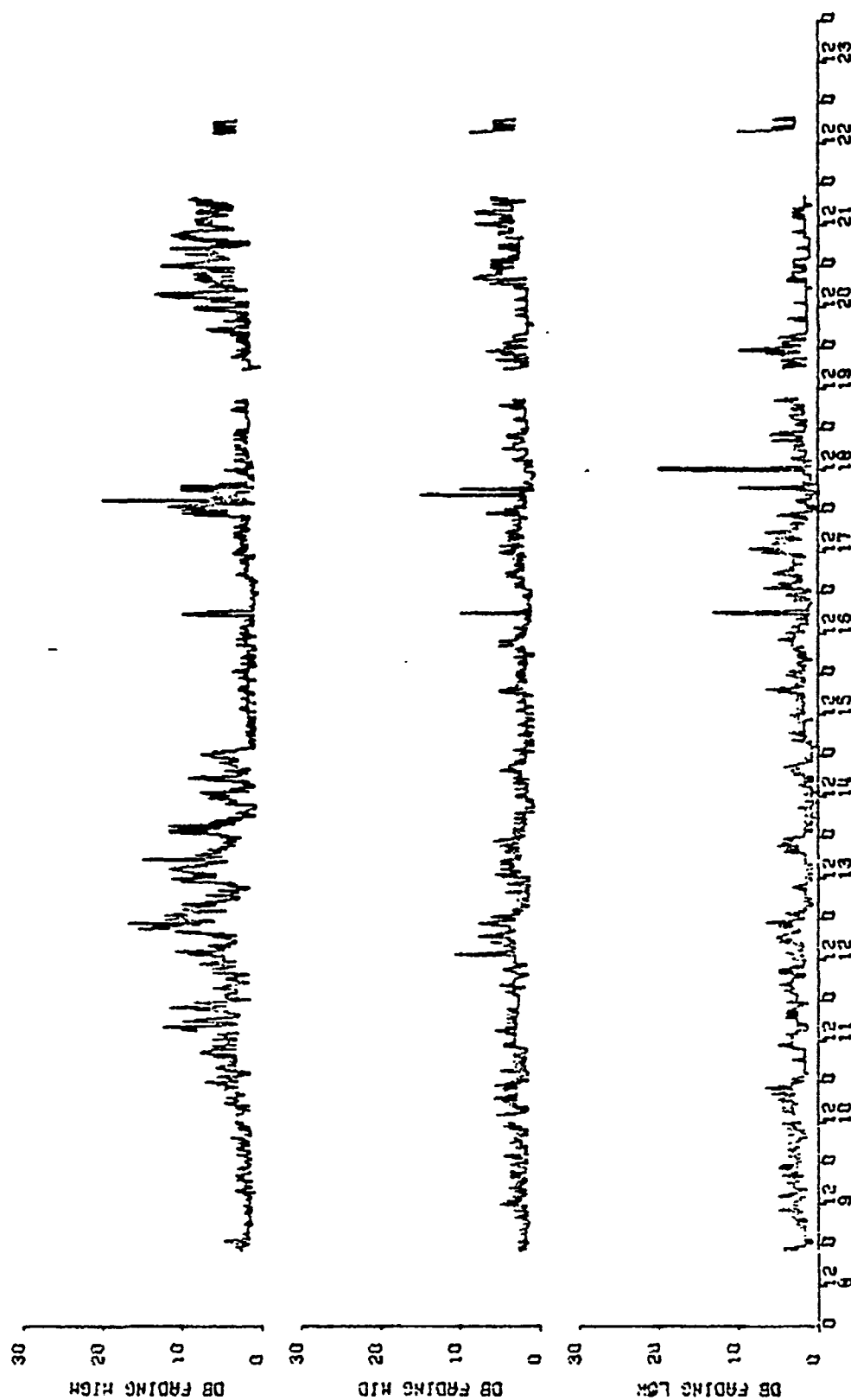
X 2500 MHz: QUESAS TO KEY WEST, FLORIDA MAY, 1972

Figure 24. Path loss for middle X-band antenna and path loss difference mid-low antenna.



X BAND WRAQUESAS 18 KEY WEST, FLORIDA MAY, 1972

Figure 25. Path loss for low X-band antenna and path loss difference high-mid antenna.



X BAND RADAR DATA TO KEY WEST, FLORIDA MAY, 1972

Figure 26. Fading X-band.

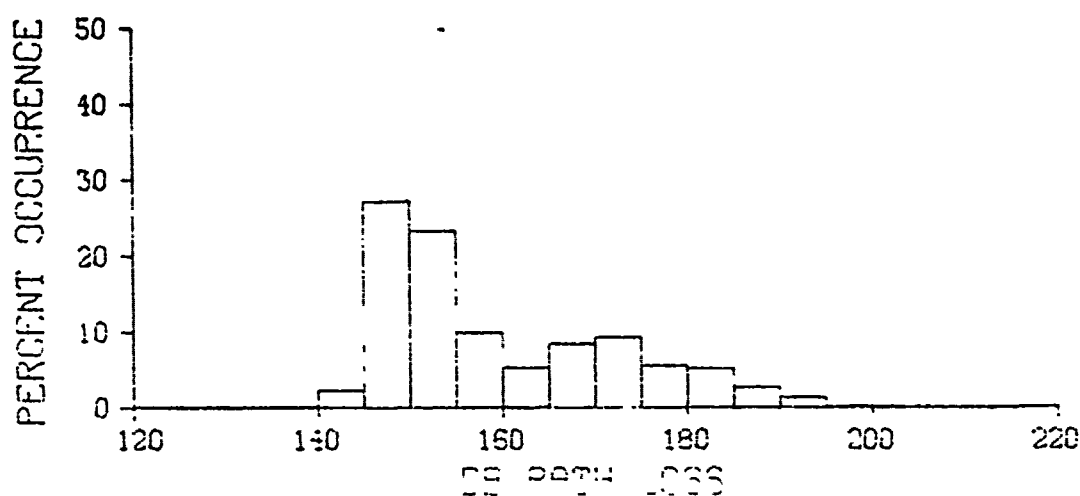
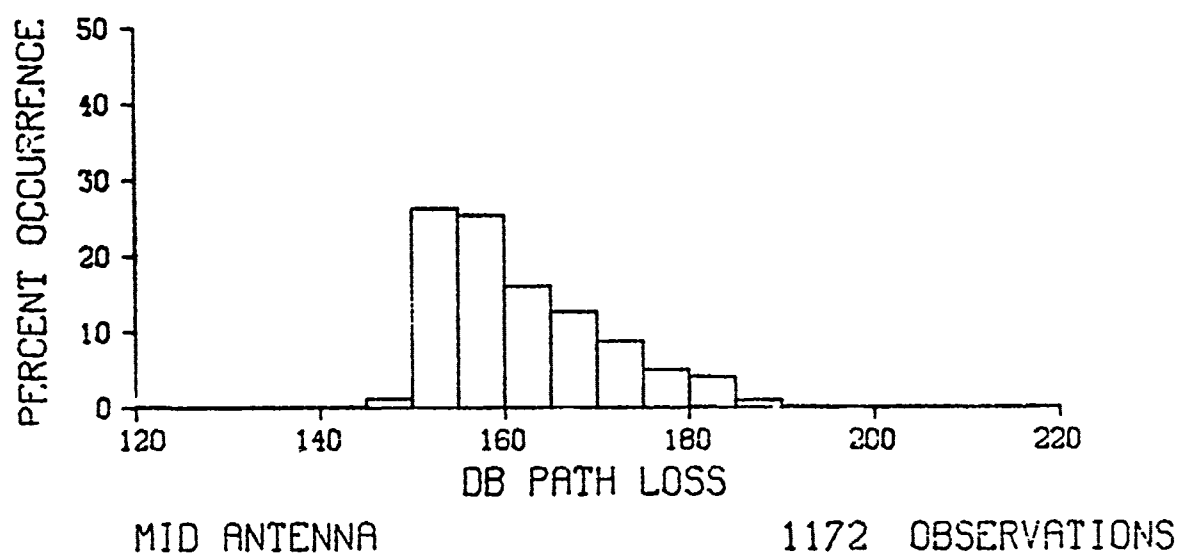
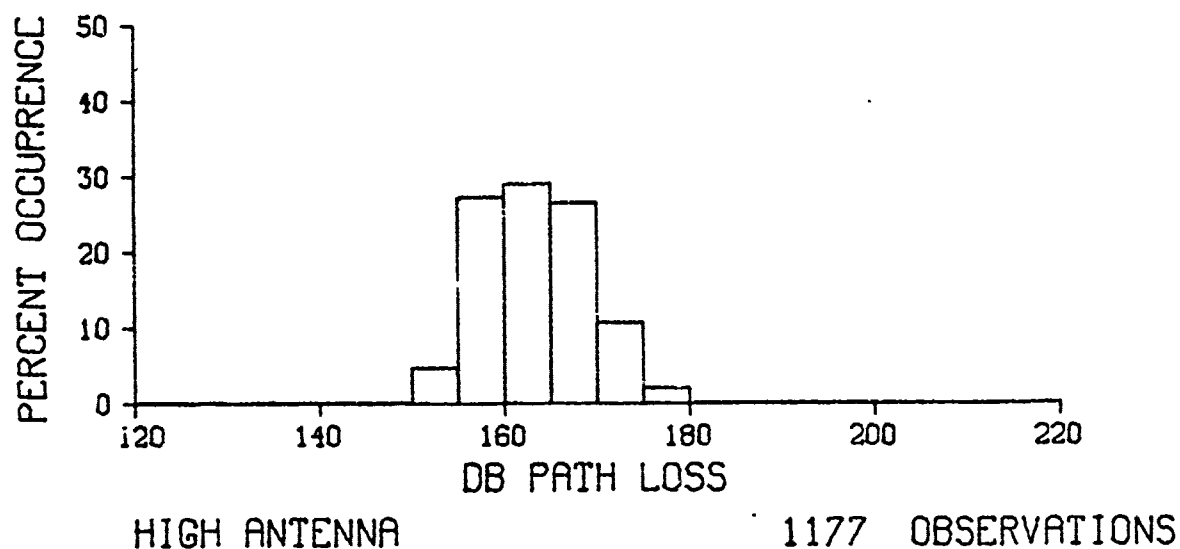
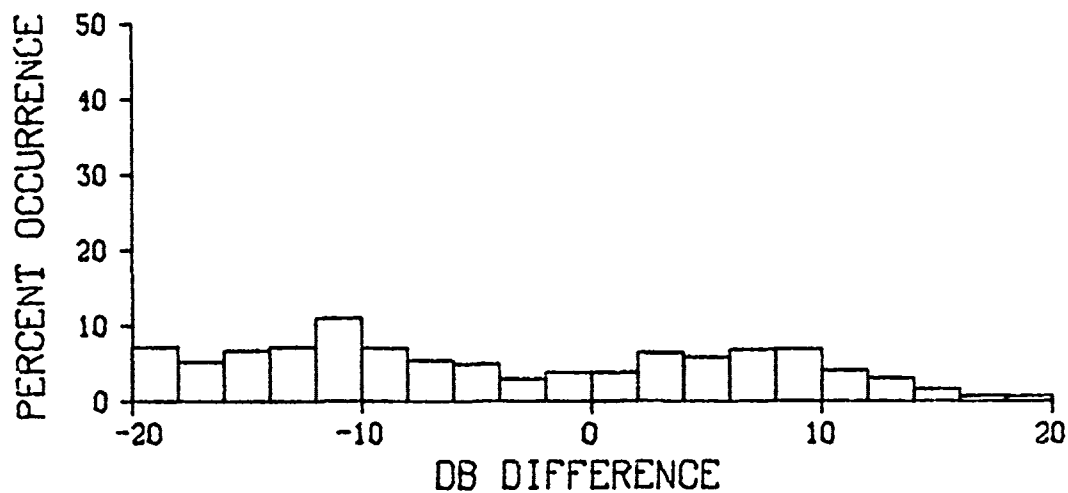
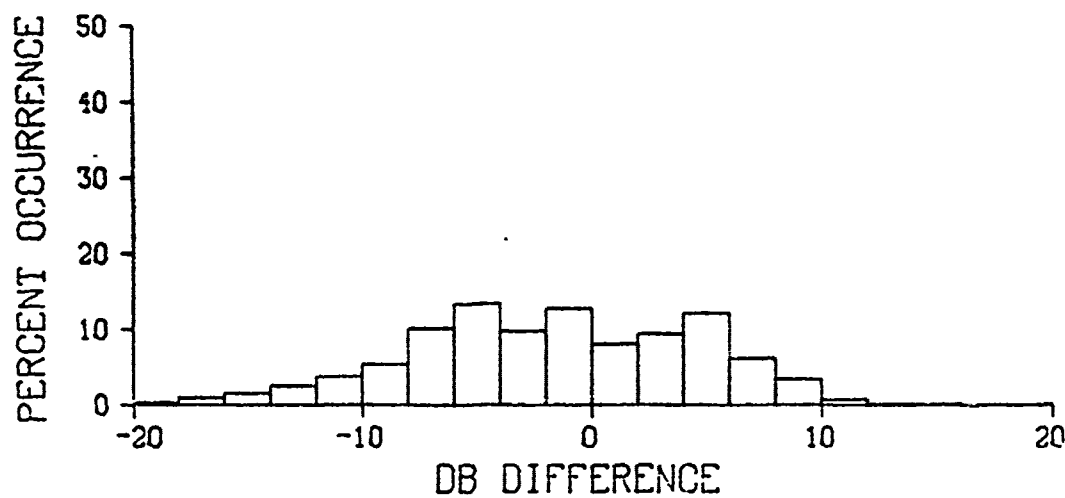


Figure 27. Frequency distributions of path loss for X-band.



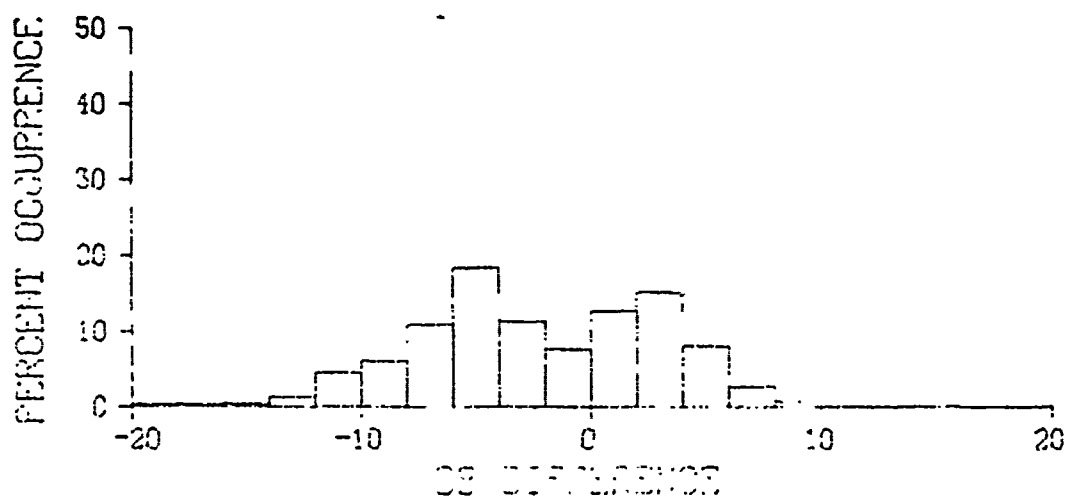
HIGH-LOW

1163 OBSERVATIONS



HIGH-MID

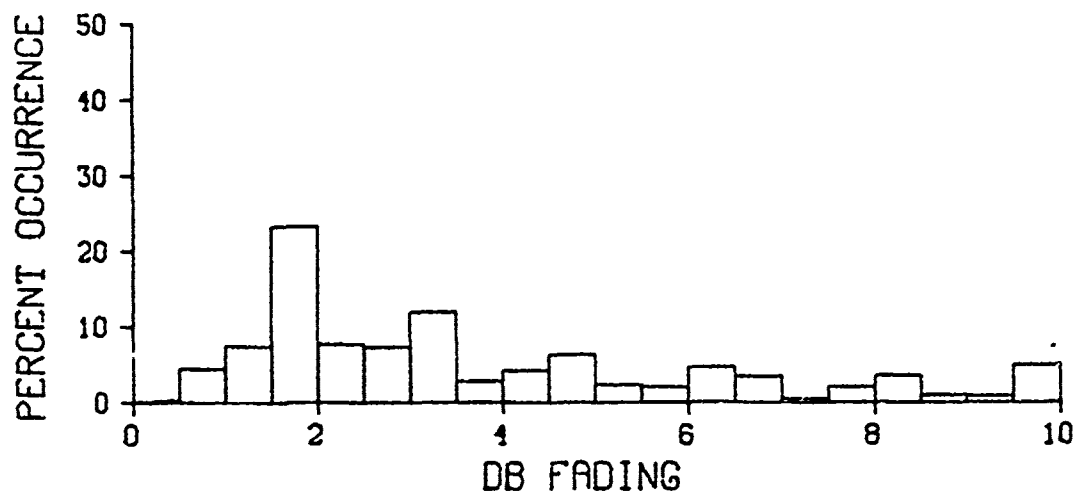
1166 OBSERVATIONS



MID-LOW

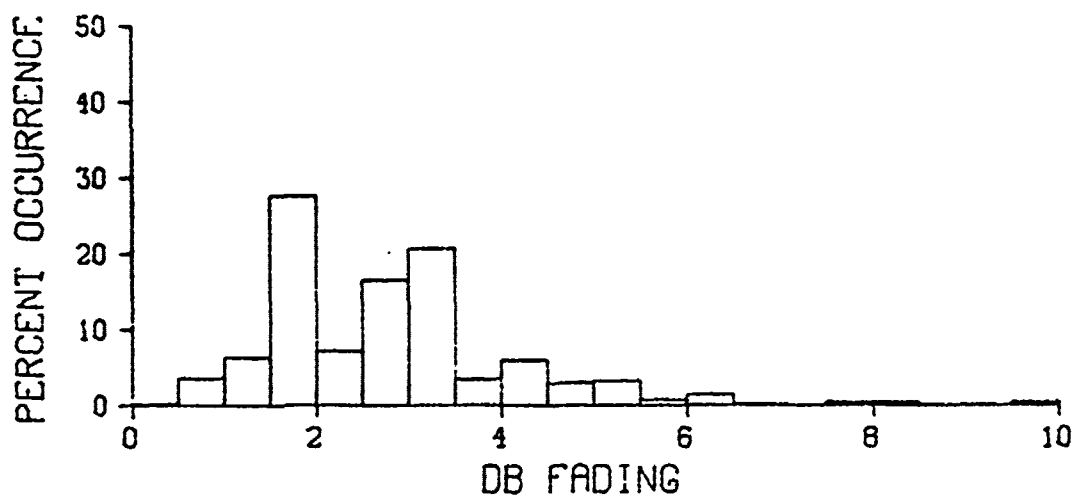
1167 OBSERVATIONS

Figure 28. Frequency distributions of path loss differences between antennas for X-band.



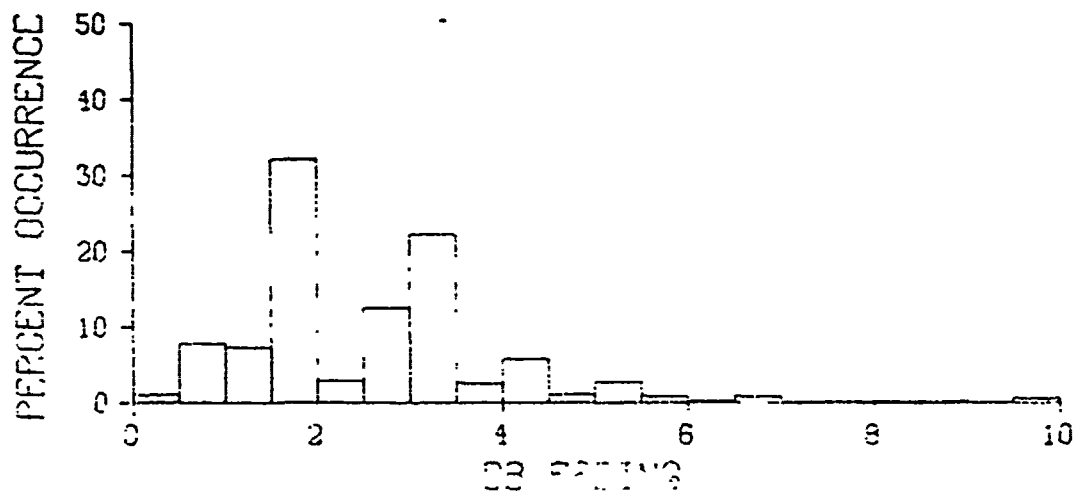
HIGH ANTENNA

1177 OBSERVATIONS



MID ANTENNA

1172 OBSERVATIONS

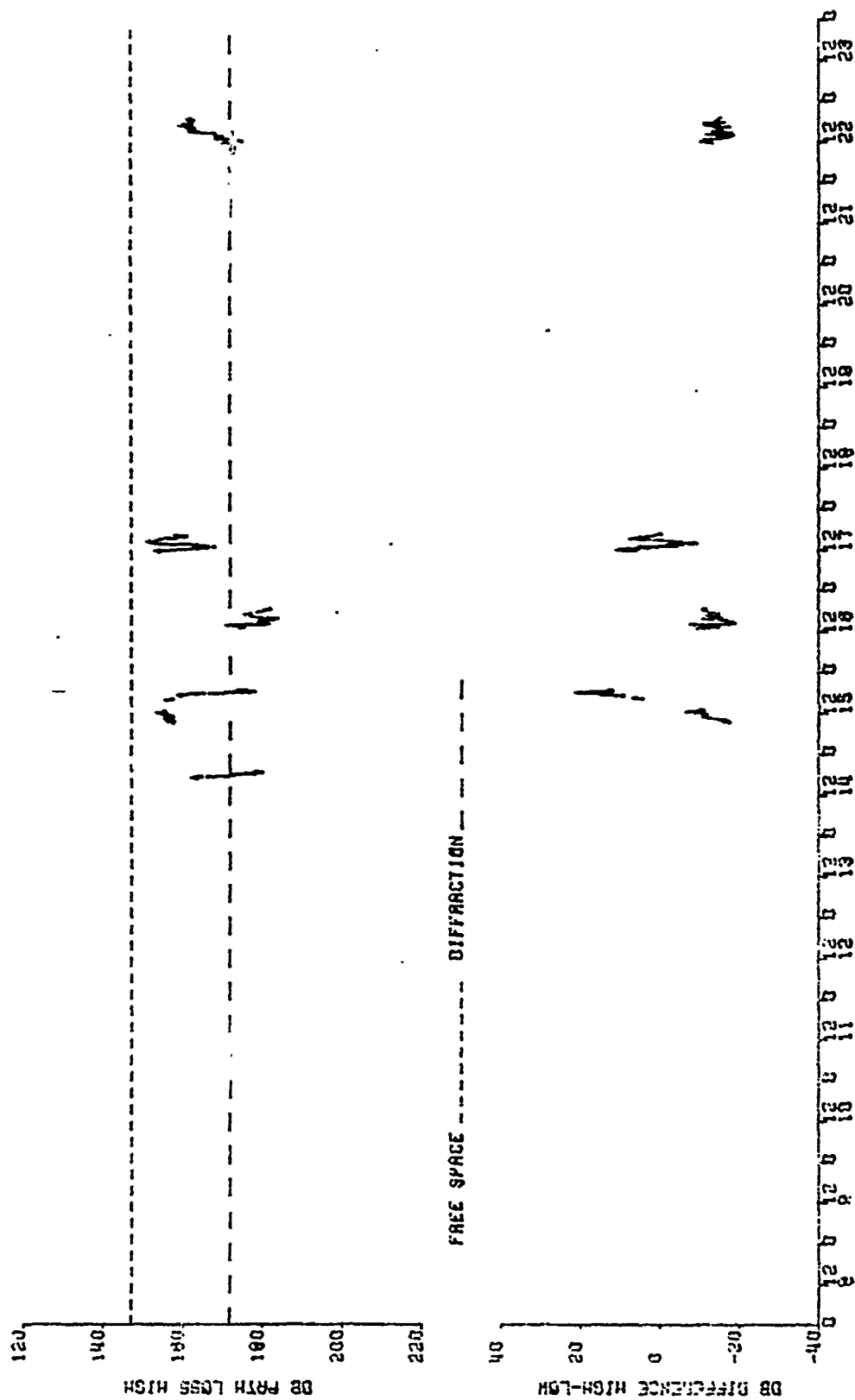


X-BAND

1170 OBSERVATIONS

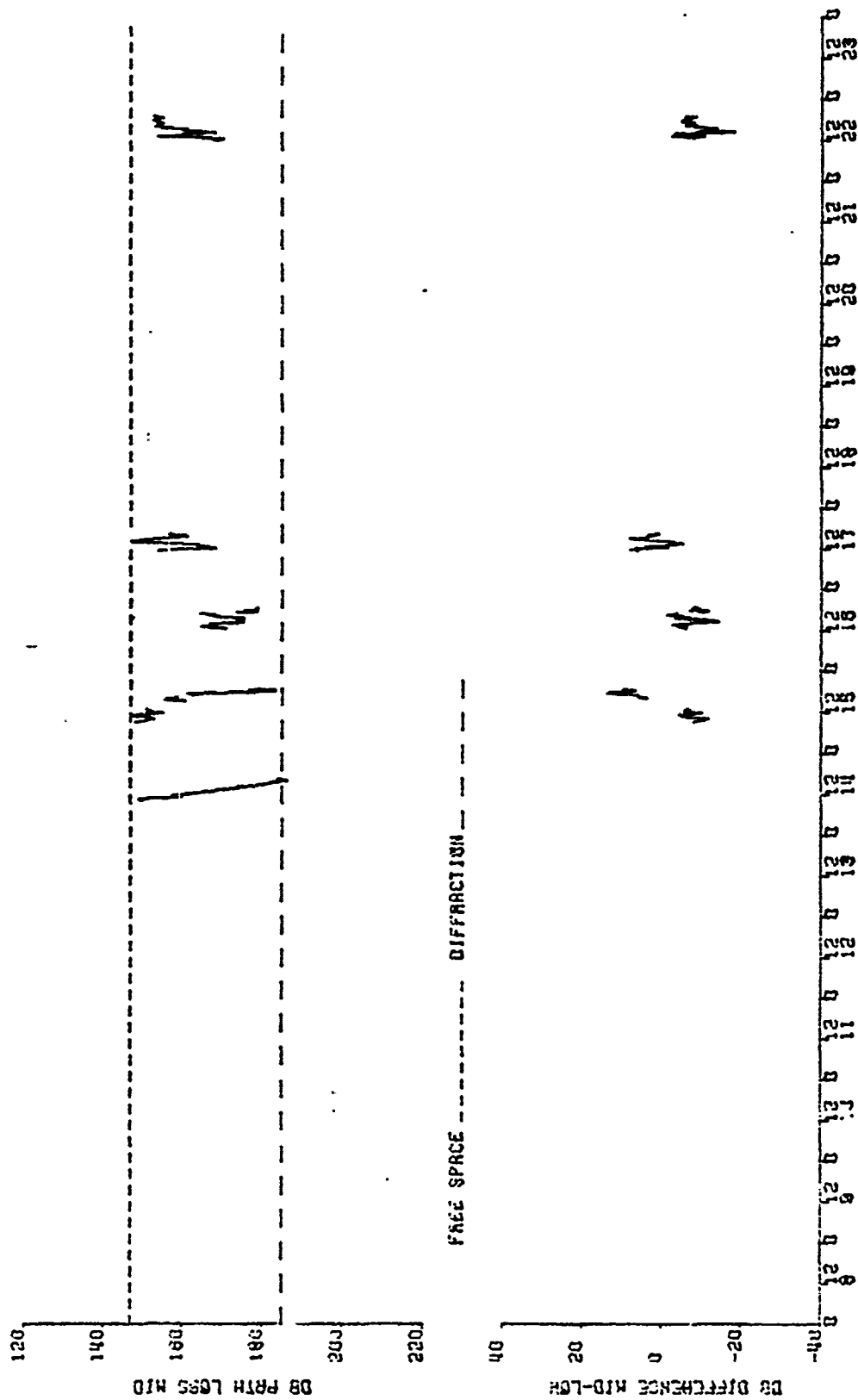
X-BAND, 100 MHz, 100 MHz, 100 MHz

Figure 29. Frequency distributions of fading for X-band.



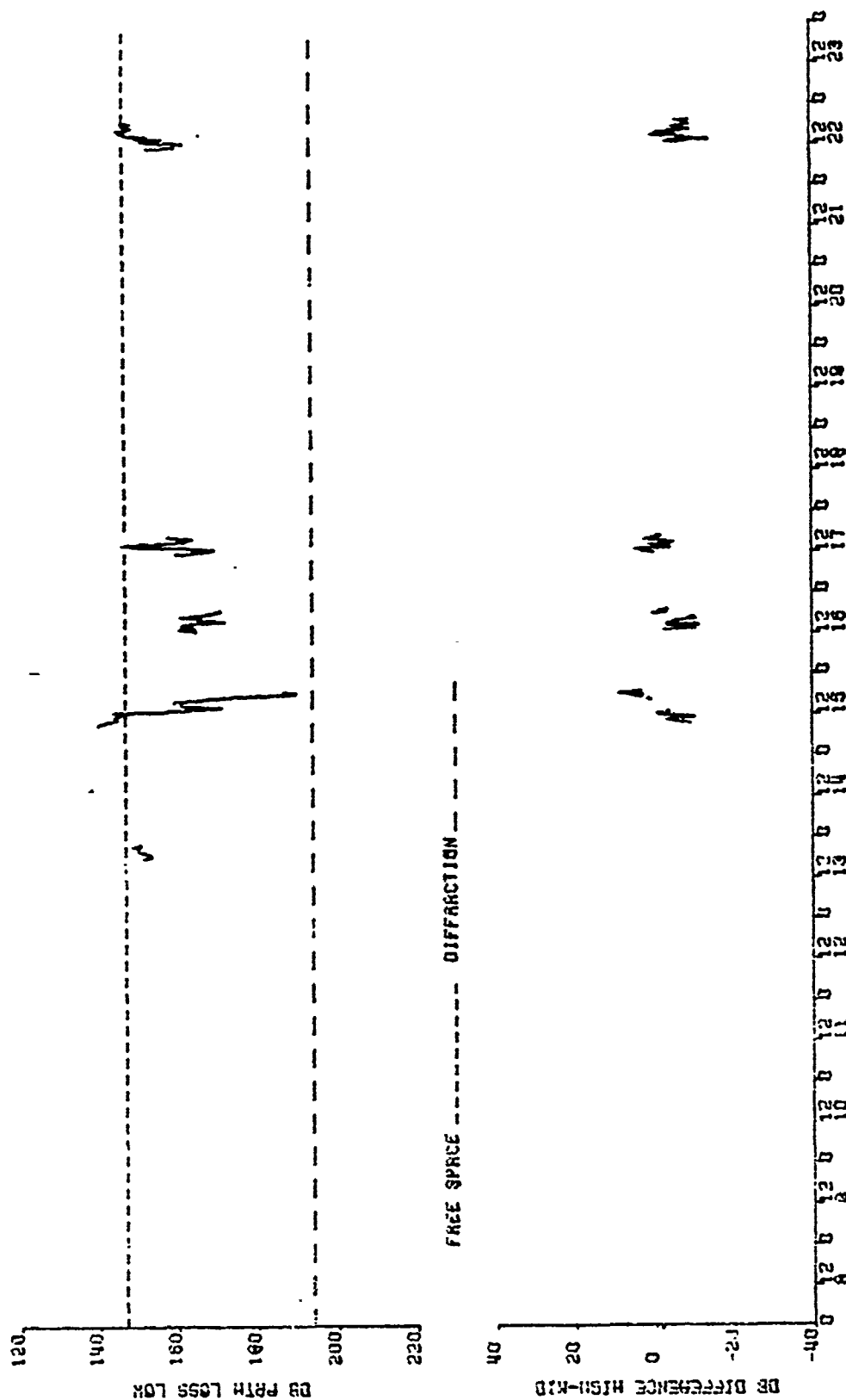
KU BAND WAKESBURY TO KEY WEST, FLORIDA MAY, 1972

Figure 30. Path loss for high Ku-band antenna and path loss difference high-low antenna.



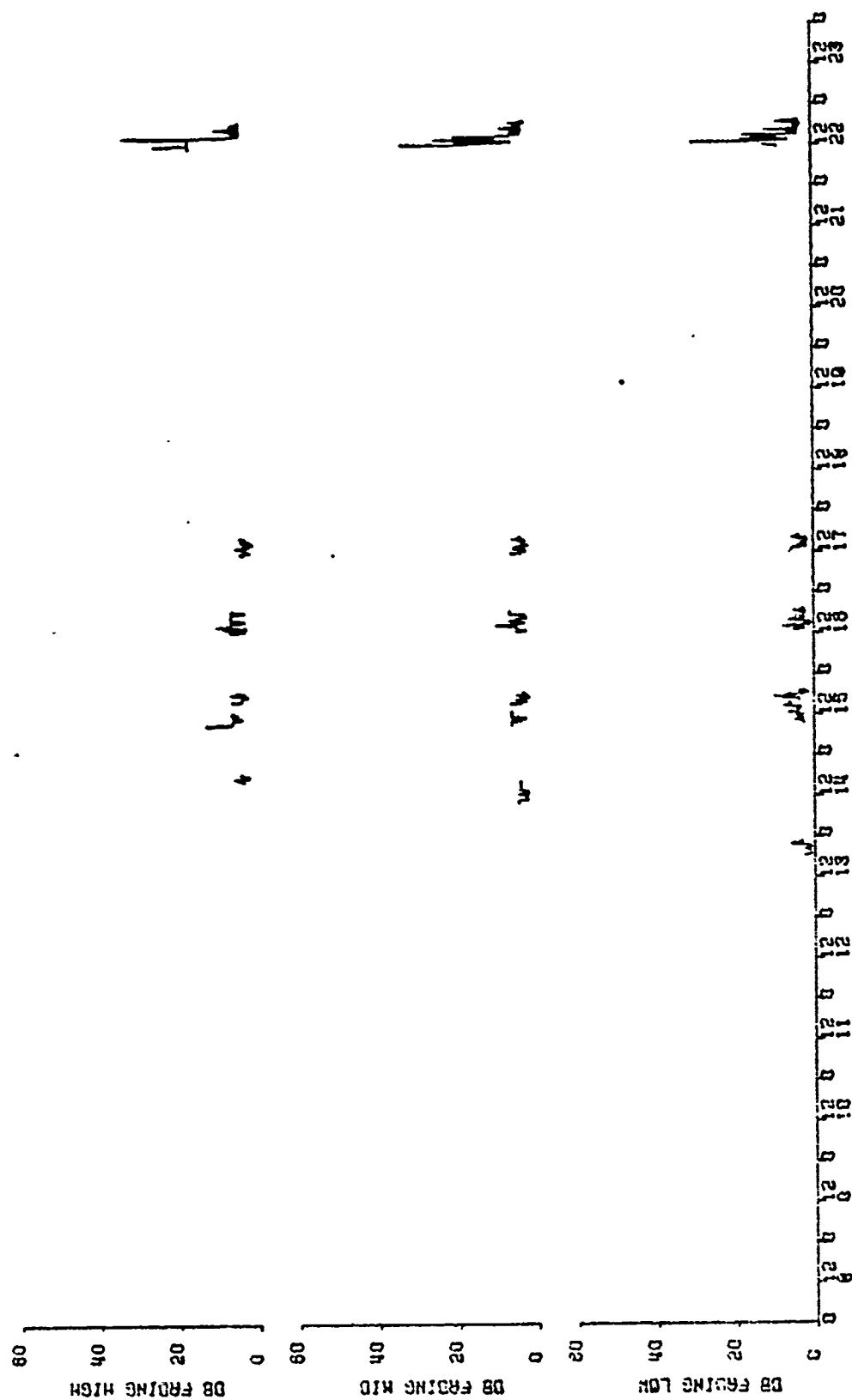
KU BAND WAVELENGTHS TO KEY WEST, FLORIDA MAY, 1972

Figure 31. Path loss for middle Ku-band antenna and path loss difference mid-low antenna.



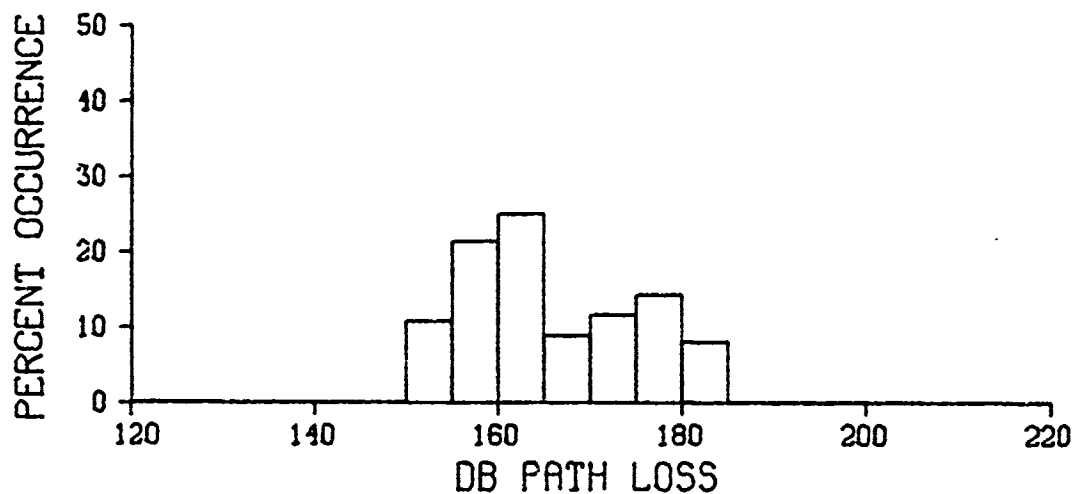
KU BAND HASKUESAS TO KEY WEST, FLORIDA MAY, 1972

Figure 32. Path loss for low Ku-band antenna and path loss difference high-mid antenna.



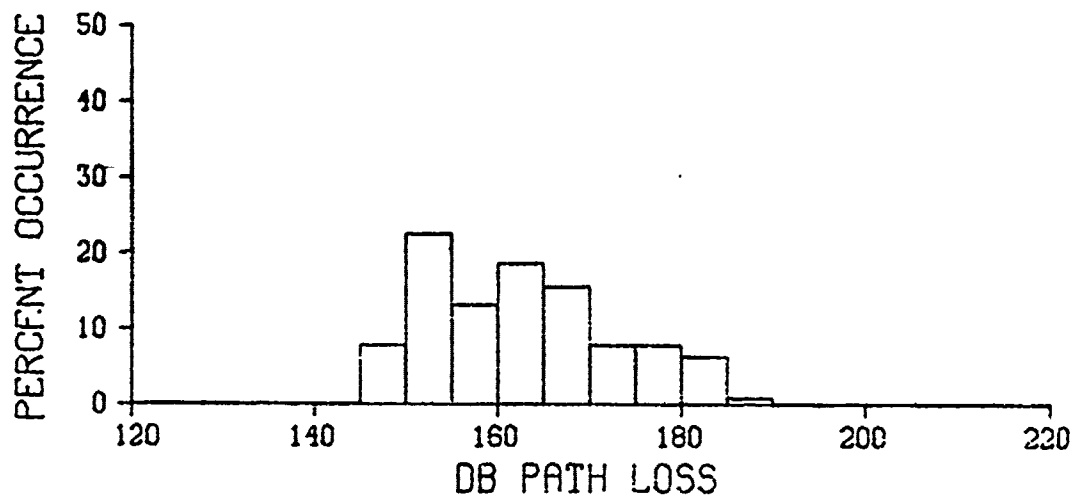
KU BAND HIRAGUESAS TO KEY WEST, FLORIDA MAY, 1972

Figure 33. Fading Ku-band.



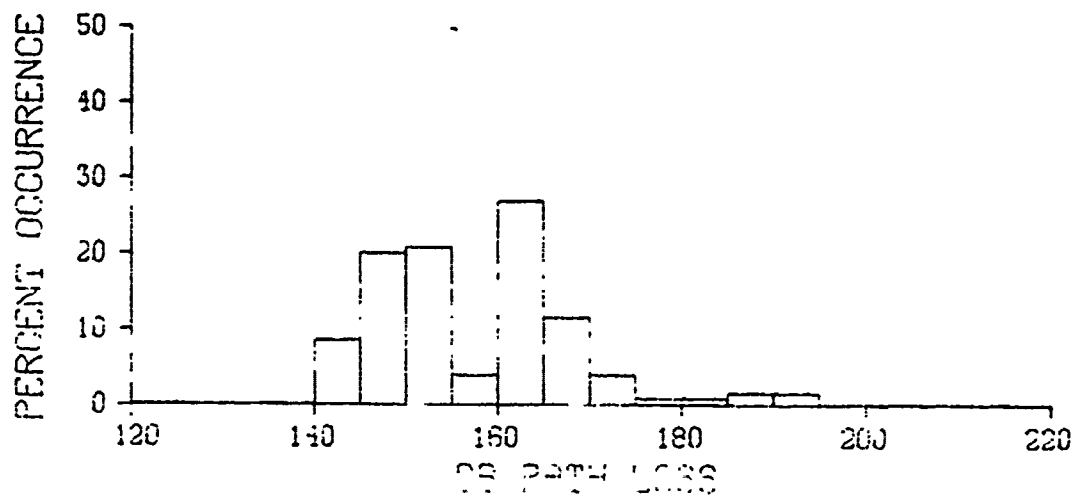
HIGH ANTENNA

112 OBSERVATIONS



MID ANTENNA

129 OBSERVATIONS



LOW ANTENNA

137 OBSERVATIONS

KU BAND, KEY 4007 091 10.0

Figure 34. Frequency distributions of path loss for Ku-band.

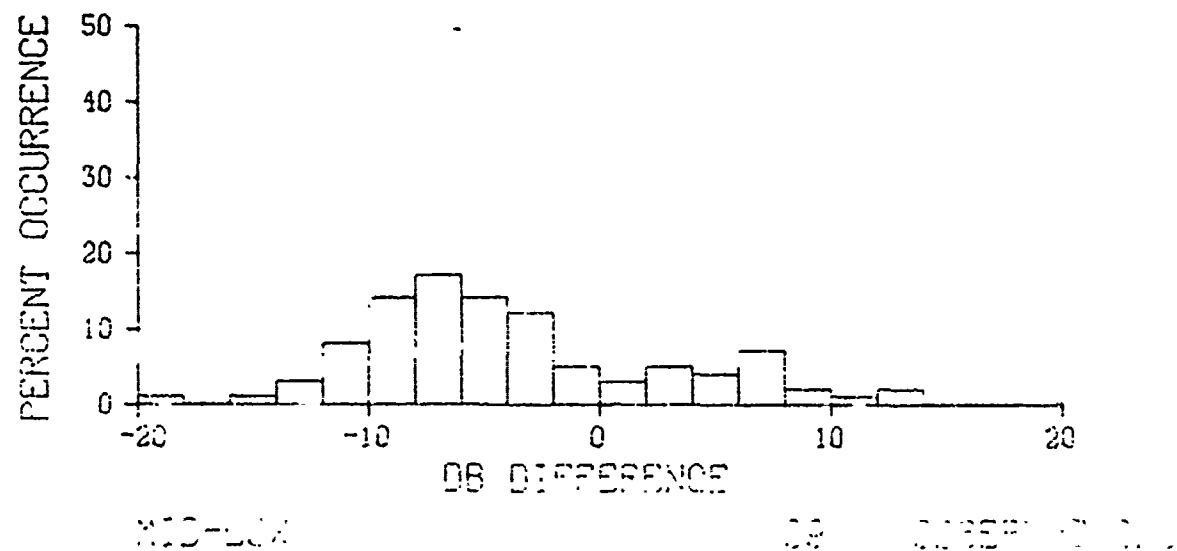
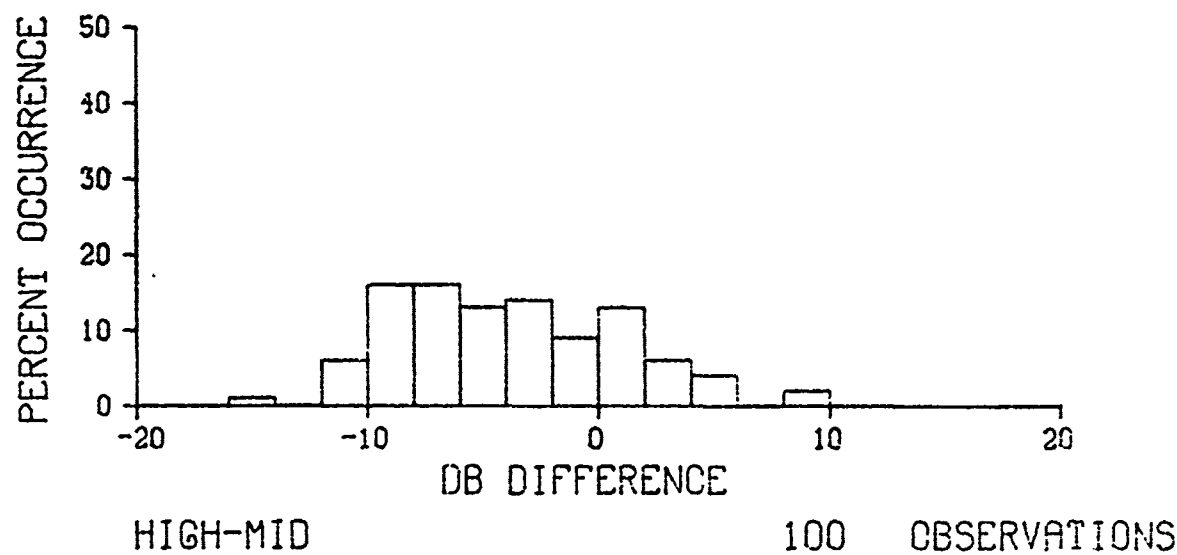
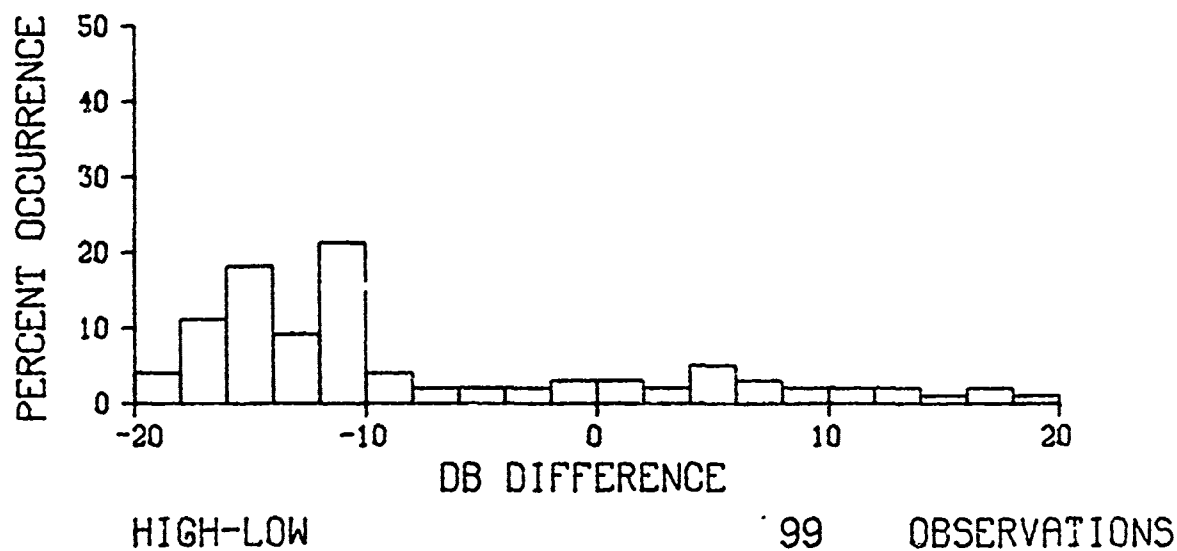


Figure 35. Frequency distributions of path loss differences for Ku-band.

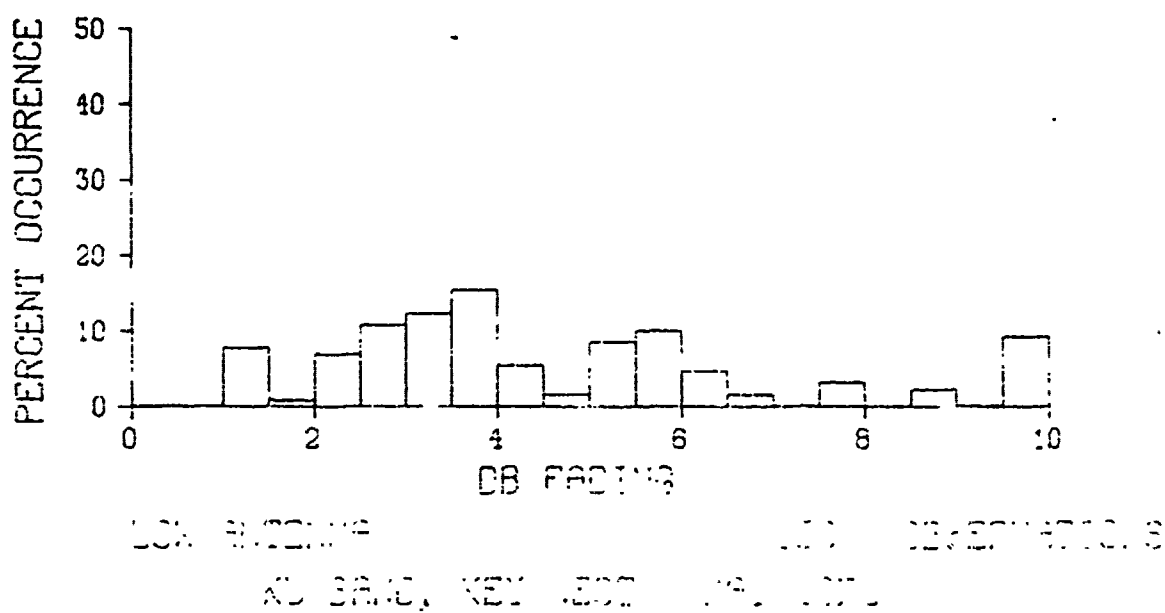
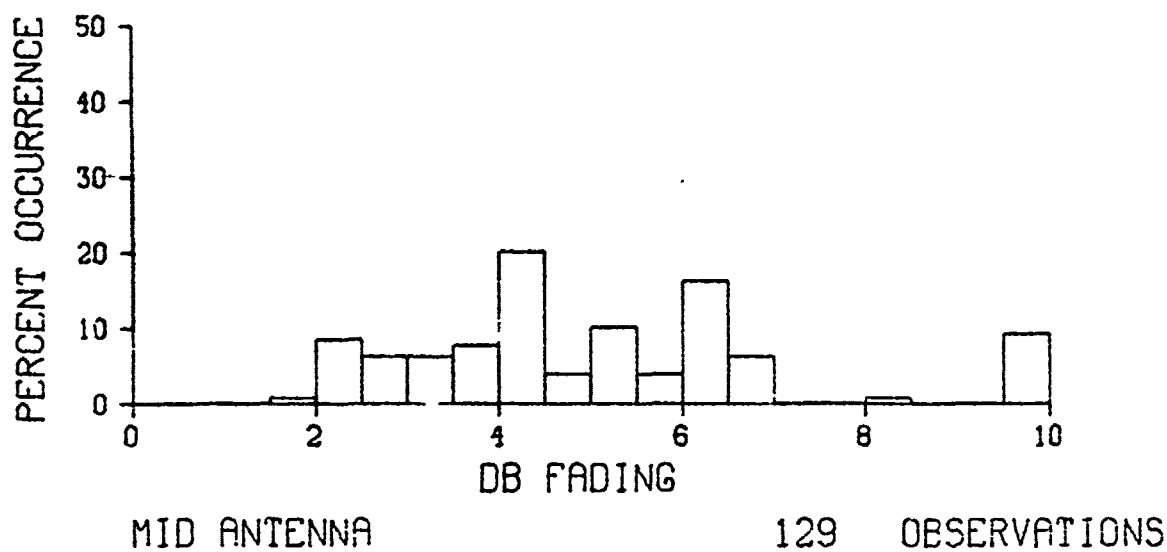
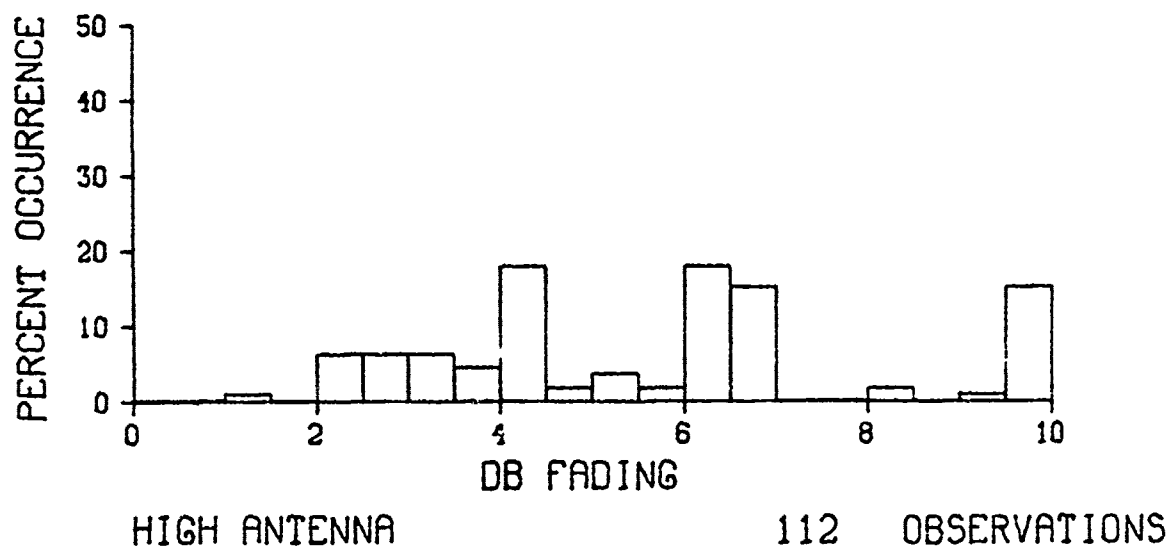


Figure 36. Frequency distributions of fading for Ku-band.

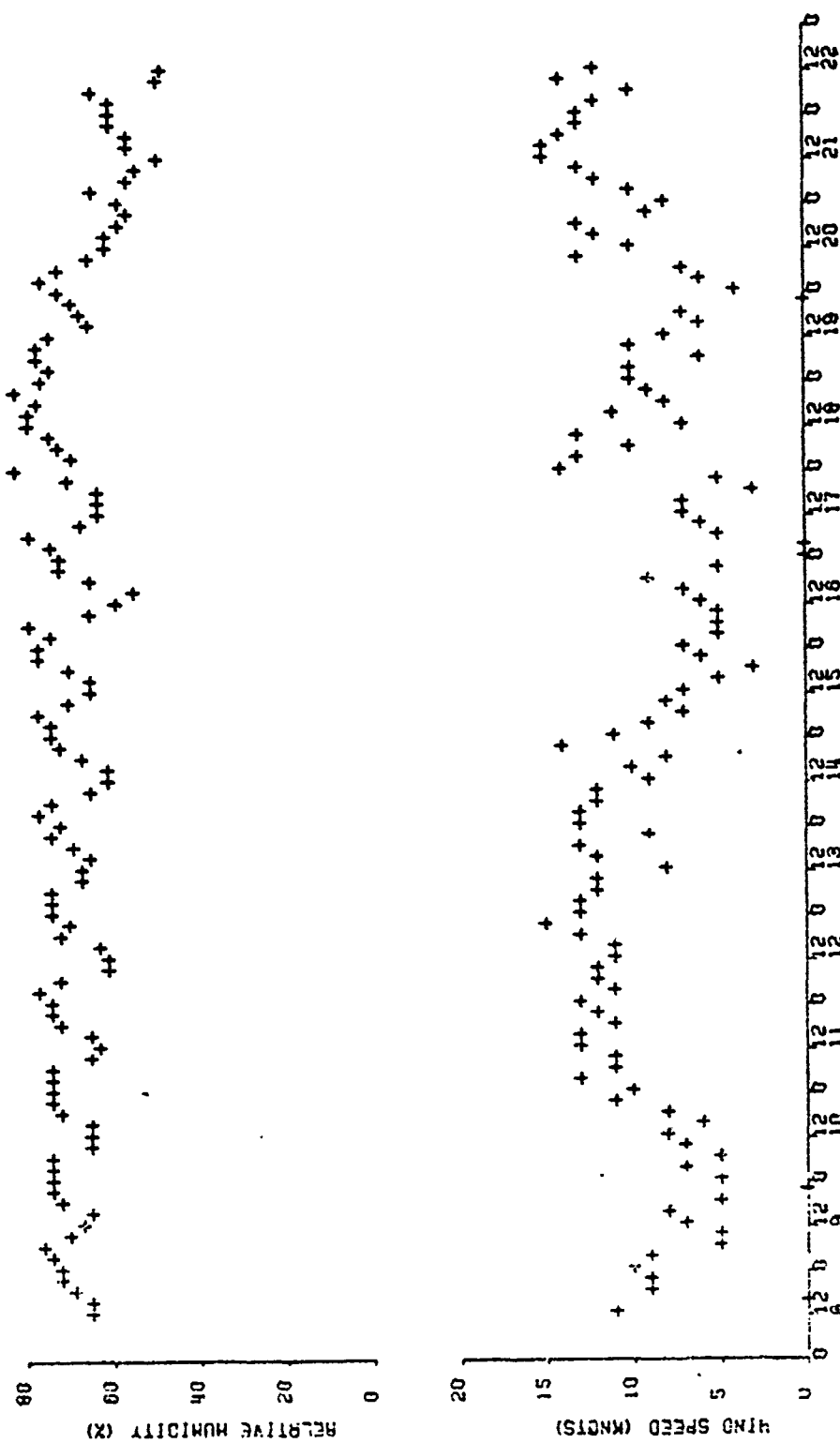
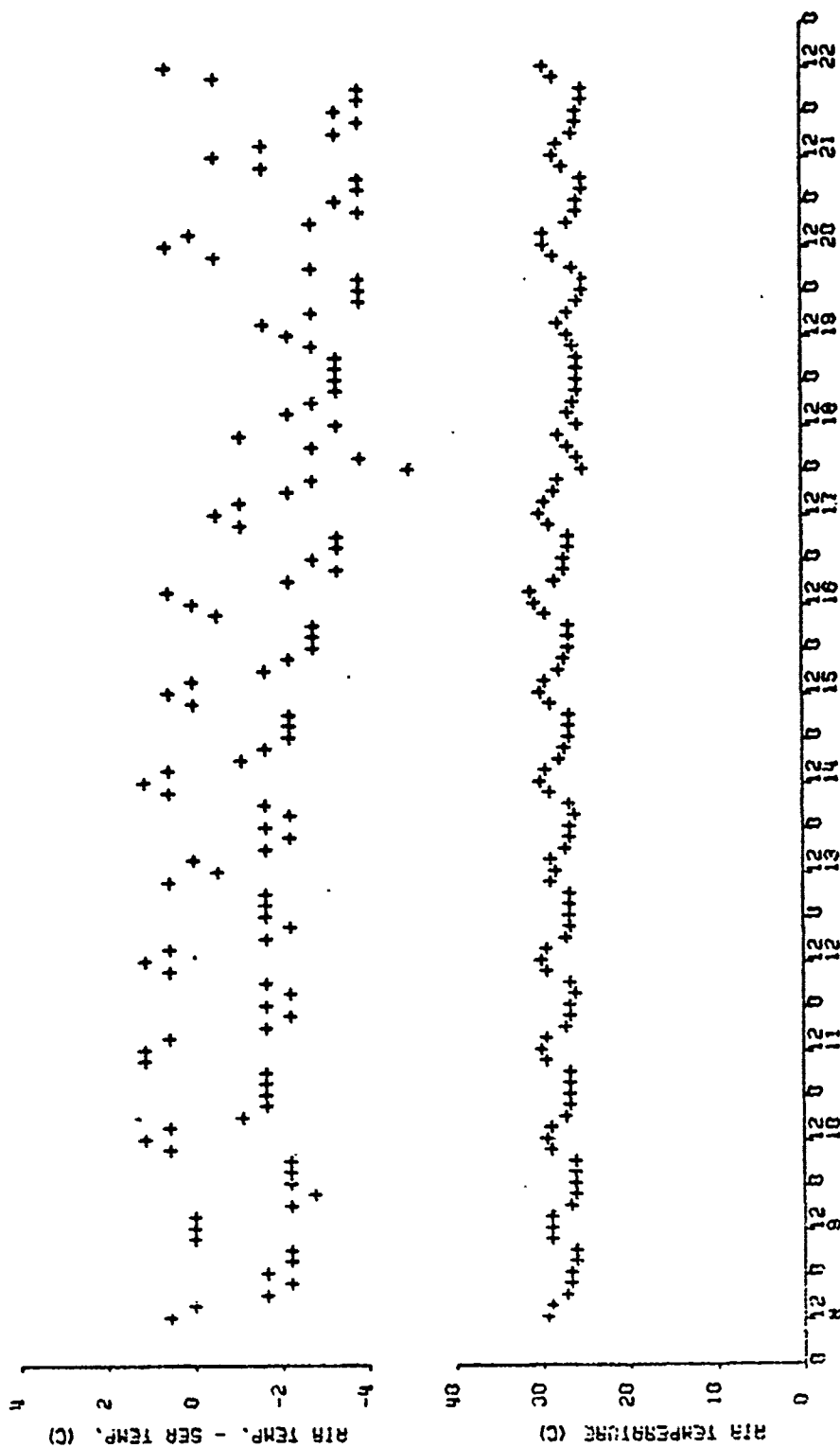


Figure 37. Relative humidity and wind speed for 8-22 May 1972 at Key West.



U.S.G. KEY WEST MAY 1972

Figure 38. Air temperature - sea temperature difference and air temperature for 8-22 May 1972 at Key West

12.1

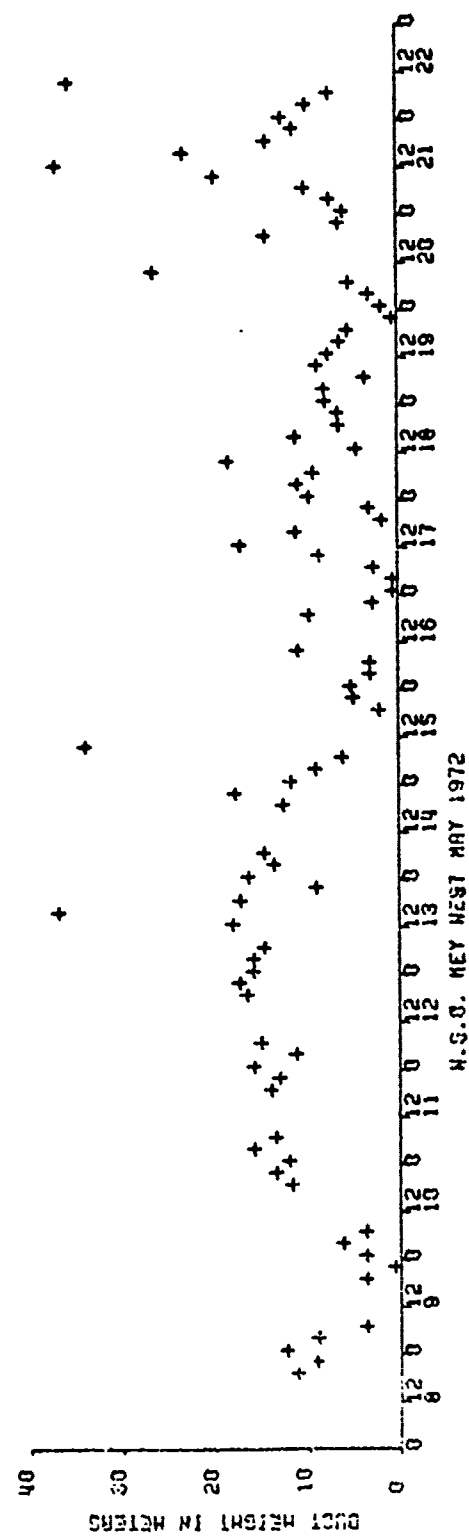


Figure 39. Duct height for 8-22 May 1972 at Key West.

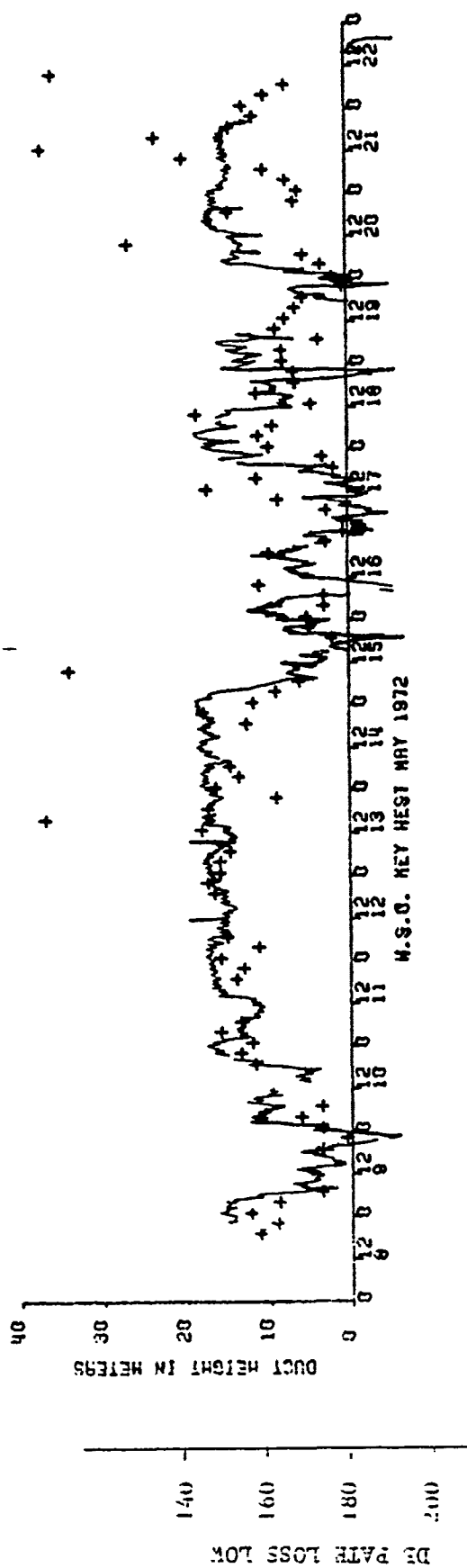


Figure 40. Path loss for low X-band antenna (solid curve) and duct height (asterisks).

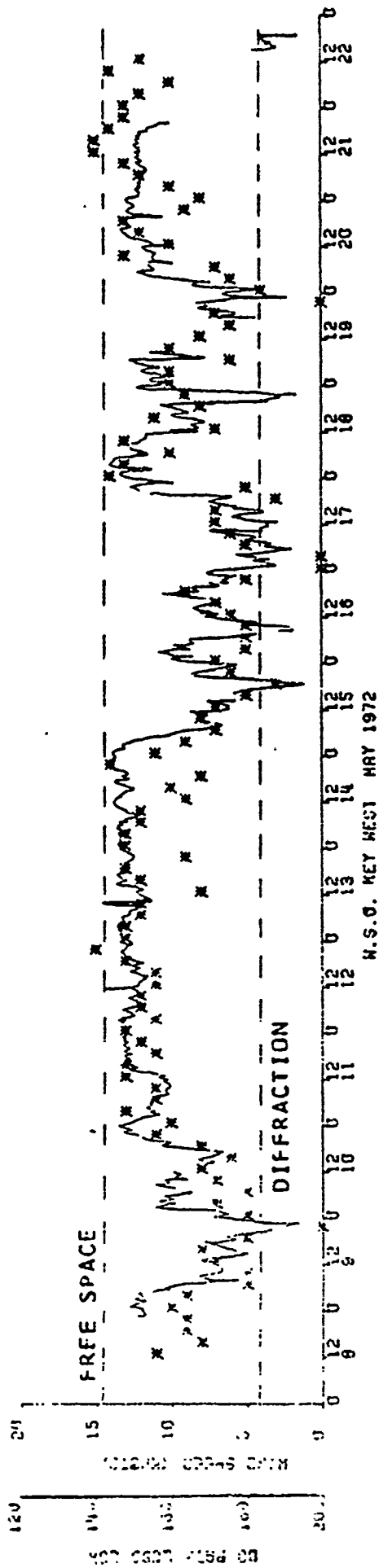


Figure 41. Path loss for low X-band antenna (solid curve) and wind speed (asterisks).

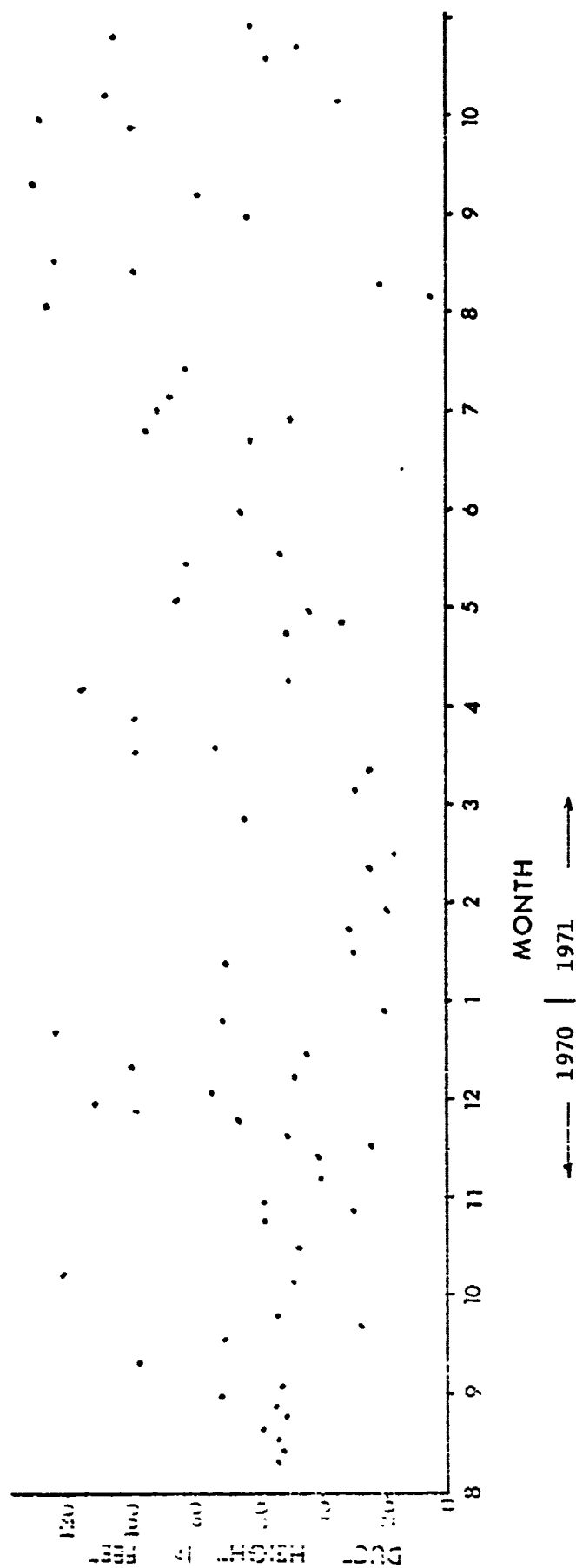


Figure 42. Duct height for August 1970-October 1971 using 1000 hours observations.

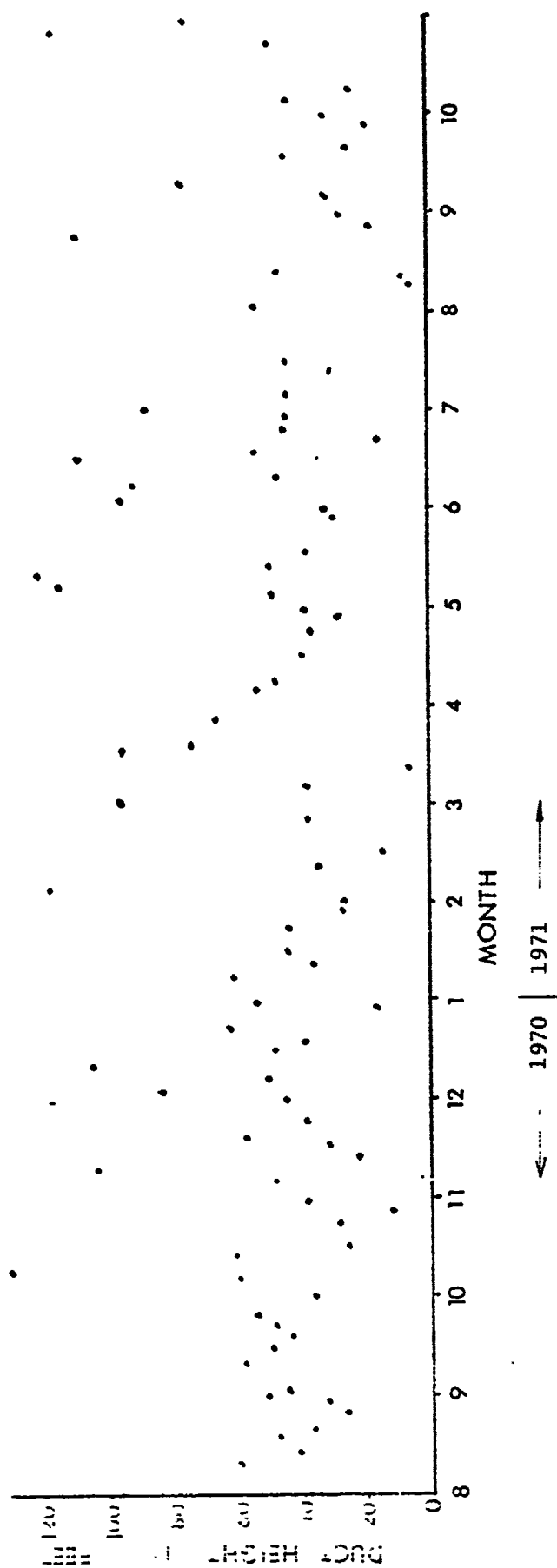


Figure 43. Duct height for August 1970-October 1971 using daily averages.

## IX. TABLES

|  | <u>Page</u> |
|--|-------------|
| 1. Statistical presentation for L-band.  | 62          |
| 2. Frequency distributions of path loss for L-band.                                | 63          |
| 3. Frequency distributions of path loss differences between antennas for L-band.   | 64          |
| 4. Frequency distributions of fading L-band.                                       | 65          |
| 5. Statistical presentation for S-band.  | 66          |
| 6. Frequency distributions of path loss for S-band.                                | 67          |
| 7. Frequency distributions of path loss differences between antennas for S-band.   | 68          |
| 8. Frequency distributions of fading S-band.                                       | 69          |
| 9. Statistical presentation for X-band.  | 70          |
| 10. Frequency distributions of path loss for X-band.                               | 71          |
| 11. Frequency distributions of path loss differences between antennas for X-band.  | 72          |
| 12. Frequency distributions of fading X-band.                                      | 73          |
| 13. Statistical presentation for Ku-band.  | 74          |
| 14. Frequency distributions of path loss for Ku-band.                              | 75          |
| 15. Frequency distributions of path loss differences between antennas for Ku-band. | 76          |
| 16. Frequency distributions of fading Ku-band.                                     | 77          |

## L BAND FIAKQUESAS TO KEY WEST, FLORIDA MAY, 1972

| HIGH-LOW            |          | MID-LOW             |          | HIGH-MID            |          |
|---------------------|----------|---------------------|----------|---------------------|----------|
| 1.0 % >             | 20.0 DB  | 0.0 % >             | 20.0 DB  | 0.0 % >             | 20.0 DB  |
| 90.0 % >            | 15.0 DB  | 0.3 % >             | 15.0 DB  | 0.3 % >             | 15.0 DB  |
| 99.4 % >            | 10.0 DB  | 0.8 % >             | 10.0 DB  | 54.3 % >            | 10.0 DB  |
| 99.6 % >            | 6.0 DB   | 61.0 % >            | 6.0 DB   | 99.7 % >            | 6.0 DB   |
| 100.0 % >           | 3.0 DB   | 90.6 % >            | 3.0 DB   | 99.9 % >            | 3.0 DB   |
| 100.0 % >           | 0.0 DB   | 95.6 % >            | 0.0 DB   | 100.0 % >           | 0.0 DB   |
| 100.0 % >           | -3.0 DB  | 99.7 % >            | -3.0 DB  | 100.0 % >           | -3.0 DB  |
| 100.0 % >           | -6.0 DB  | 99.9 % >            | -6.0 DB  | 100.0 % >           | -6.0 DB  |
| 100.0 % >           | -10.0 DB | 100.0 % >           | -10.0 DB | 100.0 % >           | -10.0 DB |
| 100.0 % >           | -15.0 DB | 100.0 % >           | -15.0 DB | 100.0 % >           | -15.0 DB |
| 100.0 % >           | -20.0 DB | 100.0 % >           | -20.0 DB | 100.0 % >           | -20.0 DB |
| TOTAL ENTRIES = 780 |          | TOTAL ENTRIES = 787 |          | TOTAL ENTRIES = 785 |          |

| FADING HIGH         |         | FADING MIDDLE       |         | FADING LOW          |         |
|---------------------|---------|---------------------|---------|---------------------|---------|
| 0.0 % >             | 20.0 DB | 0.0 % >             | 20.0 DB | 0.0 % >             | 20.0 DB |
| 0.0 % >             | 15.0 DB | 0.0 % >             | 15.0 DB | 0.0 % >             | 15.0 DB |
| 0.0 % >             | 10.0 DB | 0.0 % >             | 10.0 DB | 0.4 % >             | 10.0 DB |
| 0.0 % >             | 8.0 DB  | 0.2 % >             | 8.0 DB  | 1.8 % >             | 8.0 DB  |
| 0.0 % >             | 6.0 DB  | 1.3 % >             | 6.0 DB  | 2.6 % >             | 6.0 DB  |
| 0.3 % >             | 5.0 DB  | 3.8 % >             | 5.0 DB  | 7.0 % >             | 5.0 DB  |
| 1.6 % >             | 4.0 DB  | 5.4 % >             | 4.0 DB  | 11.9 % >            | 4.0 DB  |
| 12.6 % >            | 3.0 DB  | 30.1 % >            | 3.0 DB  | 39.8 % >            | 3.0 DB  |
| 16.1 % >            | 2.0 DB  | 41.0 % >            | 2.0 DB  | 43.5 % >            | 2.0 DB  |
| 95.0 % >            | 1.0 DB  | 99.6 % >            | 1.0 DB  | 57.7 % >            | 1.0 DB  |
| TOTAL ENTRIES = 793 |         | TOTAL ENTRIES = 757 |         | TOTAL ENTRIES = 796 |         |

TABLE 1. Statistical presentation for L-band.

## L BAND, KEY WEST MAY 1972

| PATH LOSS      | % HIGH | % MID | % LOW |
|----------------|--------|-------|-------|
| 120.0 TO 125.0 | 0.0    | 0.0   | 0.0   |
| 125.0 TO 130.0 | 0.0    | 0.0   | 0.0   |
| 130.0 TO 135.0 | 0.0    | 0.0   | 0.0   |
| 135.0 TO 140.0 | 7.6    | 0.0   | 0.0   |
| 140.0 TO 145.0 | 17.3   | 0.0   | 0.0   |
| 145.0 TO 150.0 | 43.5   | 7.3   | 0.0   |
| 150.0 TO 155.0 | 27.0   | 20.5  | 0.5   |
| 155.0 TO 160.0 | 4.7    | 36.0  | 17.4  |
| 160.0 TO 165.0 | 0.0    | 30.9  | 35.8  |
| 165.0 TO 170.0 | 0.0    | 5.4   | 39.8  |
| 170.0 TO 175.0 | 0.0    | 0.0   | 4.0   |
| 175.0 TO 180.0 | 0.0    | 0.0   | 2.1   |
| 180.0 TO 185.0 | 0.0    | 0.0   | 0.3   |
| 185.0 TO 190.0 | 0.0    | 0.0   | 0.0   |
| 190.0 TO 195.0 | 0.0    | 0.0   | 0.0   |
| 195.0 TO 200.0 | 0.0    | 0.0   | 0.0   |
| 200.0 TO 205.0 | 0.0    | 0.0   | 0.0   |
| 205.0 TO 210.0 | 0.0    | 0.0   | 0.0   |
| 210.0 TO 215.0 | 0.0    | 0.0   | 0.0   |
| 215.0 TO 220.0 | 0.0    | 0.0   | 0.0   |
| ENTRIES        | 793    | 797   | 798   |

TABLE 2. Frequency distributions of path loss for L-band.

| DIFFERENCE     | % HIGH-LOW | % HIGH-MID | % MID-LOW |
|----------------|------------|------------|-----------|
| -20.0 TO -18.0 | 0.0        | 0.0        | 0.0       |
| -18.0 TO -16.0 | 0.0        | 0.0        | 0.0       |
| -16.0 TO -14.0 | 0.0        | 0.0        | 0.0       |
| -14.0 TO -12.0 | 0.0        | 0.0        | 0.0       |
| -12.0 TO -10.0 | 0.0        | 0.0        | 0.0       |
| -10.0 TO -8.0  | 0.0        | 0.0        | 0.0       |
| -8.0 TO -6.0   | 0.0        | 0.0        | 0.1       |
| -6.0 TO -4.0   | 0.0        | 0.0        | 0.0       |
| -4.0 TO -2.0   | 0.0        | 0.0        | 0.3       |
| -2.0 TO 0.0    | 0.0        | 0.0        | 0.0       |
| 0.0 TO 2.0     | 0.0        | 0.1        | 0.5       |
| 2.0 TO 4.0     | 0.3        | 0.0        | 1.1       |
| 4.0 TO 6.0     | 0.1        | 0.1        | 20.5      |
| 6.0 TO 8.0     | 0.1        | 2.4        | 68.6      |
| 8.0 TO 10.0    | 0.1        | 30.6       | 8.0       |
| 10.0 TO 12.0   | 0.4        | 65.2       | 0.4       |
| 12.0 TO 14.0   | 2.2        | 1.3        | 0.1       |
| 14.0 TO 16.0   | 15.5       | 0.0        | 0.3       |
| 16.0 TO 18.0   | 64.4       | 0.1        | 0.1       |
| 18.0 TO 20.0   | 16.9       | 0.1        | 0.0       |
| ENTRIES        | 780        | 785        | 787       |

TABLE 3. Frequency distributions of path loss differences between antennas for L-band.

## L BAND, KEY WEST      MAY 1972

| FADING  |      | % HIGH | % MID | % LOW |
|---------|------|--------|-------|-------|
| 0.0 TO  | 0.5  | 0.3    | 0.0   | 0.1   |
| 0.5 TO  | 1.0  | 3.8    | 0.4   | 2.1   |
| 1.0 TO  | 1.5  | 0.0    | 0.0   | 0.0   |
| 1.5 TO  | 2.0  | 79.8   | 58.6  | 54.3  |
| 2.0 TO  | 2.5  | 0.0    | 0.0   | 0.0   |
| 2.5 TO  | 3.0  | 3.5    | 4.9   | 3.6   |
| 3.0 TO  | 3.5  | 8.6    | 5.0   | 0.0   |
| 3.5 TO  | 4.0  | 2.4    | 25.7  | 27.9  |
| 4.0 TO  | 4.5  | 0.4    | 0.0   | 0.0   |
| 4.5 TO  | 5.0  | 0.6    | 1.3   | 2.0   |
| 5.0 TO  | 5.5  | 0.4    | 0.4   | 2.9   |
| 5.5 TO  | 6.0  | 0.3    | 2.5   | 4.4   |
| 6.0 TO  | 6.5  | 0.0    | 0.4   | 0.1   |
| 6.5 TO  | 7.0  | 0.0    | 0.1   | 0.0   |
| 7.0 TO  | 7.5  | 0.0    | 0.1   | 0.4   |
| 7.5 TO  | 8.0  | 0.0    | 0.0   | 0.4   |
| 8.0 TO  | 8.5  | 0.0    | 0.4   | 0.0   |
| 8.5 TO  | 9.0  | 0.0    | 0.0   | 0.0   |
| 9.0 TO  | 9.5  | 0.0    | 0.3   | 0.4   |
| 9.5 TO  | 10.0 | 0.0    | 0.0   | 1.4   |
| ENTRIES |      | 793    | 797   | 796   |

TABLE 4. Frequency distributions of fading L-band.

# S BAND MARQUESAS TO KEY WEST, FLORIDA MAY, 1972

| HIGH-LOW             | MID-LOW             | HIGH-MID             |          |
|----------------------|---------------------|----------------------|----------|
| 1.1 % >              | 0.4 % >             | 0.1 % >              | 20.0 DB  |
| 2.9 % >              | 0.8 % >             | 0.2 % >              | 15.0 DB  |
| 4.5 % >              | 1.7 % >             | 0.9 % >              | 10.0 DB  |
| 6.7 % >              | 34.6 % >            | 27.3 % >             | 6.0 DB   |
| 95.5 % >             | 96.2 % >            | 91.0 % >             | 3.0 DB   |
| 99.9 % >             | 98.9 % >            | 99.6 % >             | 0.0 DB   |
| 99.9 % >             | 99.7 % >            | 99.8 % >             | -3.0 DB  |
| 100.0 % >            | 100.0 % >           | 99.8 % >             | -6.0 DB  |
| 100.0 % >            | 100.0 % >           | 100.0 % >            | -10.0 DB |
| 100.0 % >            | 100.0 % >           | 100.0 % >            | -15.0 DB |
| 100.0 % >            | 100.0 % >           | 100.0 % >            | -20.0 DB |
| TOTAL ENTRIES = 1018 | TOTAL ENTRIES = 998 | TOTAL ENTRIES = 1010 |          |

| FADING HIGH          | FADING MIDDLE        | FADING LOW           |         |
|----------------------|----------------------|----------------------|---------|
| 0.0 % >              | 0.0 % >              | 0.0 % >              | 20.0 DB |
| 0.0 % >              | 0.0 % >              | 0.0 % >              | 15.0 DB |
| 0.0 % >              | 0.0 % >              | 0.0 % >              | 10.0 DB |
| 0.0 % >              | 0.0 % >              | 0.7 % >              | 8.0 DB  |
| 0.0 % >              | 0.0 % >              | 0.9 % >              | 6.0 DB  |
| 0.0 % >              | 0.1 % >              | 1.9 % >              | 5.0 DB  |
| 0.3 % >              | 1.0 % >              | 5.1 % >              | 4.0 DB  |
| 2.9 % >              | 7.2 % >              | 21.4 % >             | 3.0 DB  |
| 20.3 % >             | 27.6 % >             | 37.4 % >             | 2.0 DB  |
| 72.9 % >             | 82.0 % >             | 88.4 % >             | 1.0 DB  |
| TOTAL ENTRIES = 1116 | TOTAL ENTRIES = 1080 | TOTAL ENTRIES = 1109 |         |

TABLE 5. Statistical presentation for S-band.

## S BAND, KEY WEST MAY 1972

| PATH LOSS      | % HIGH | % MID | % LOW |
|----------------|--------|-------|-------|
| 120.0 TO 125.0 | 0.0    | 0.0   | 0.0   |
| 125.0 TO 130.0 | 0.0    | 0.0   | 0.0   |
| 130.0 TO 135.0 | 0.0    | 0.0   | 0.0   |
| 135.0 TO 140.0 | 0.0    | 0.0   | 0.0   |
| 140.0 TO 145.0 | 2.0    | 0.0   | 0.0   |
| 145.0 TO 150.0 | 14.8   | 3.3   | 0.0   |
| 150.0 TO 155.0 | 25.0   | 15.4  | 3.9   |
| 155.0 TO 160.0 | 24.4   | 21.1  | 13.6  |
| 160.0 TO 165.0 | 21.1   | 21.0  | 19.1  |
| 165.0 TO 170.0 | 11.0   | 24.9  | 25.9  |
| 170.0 TO 175.0 | 1.1    | 9.5   | 20.2  |
| 175.0 TO 180.0 | 0.0    | 4.0   | 11.0  |
| 180.0 TO 185.0 | 0.3    | 0.0   | 4.1   |
| 185.0 TO 190.0 | 0.4    | 0.6   | 1.0   |
| 190.0 TO 195.0 | 0.0    | 0.2   | 0.8   |
| 195.0 TO 200.0 | 0.0    | 0.0   | 0.4   |
| 200.0 TO 205.0 | 0.0    | 0.0   | 0.0   |
| 205.0 TO 210.0 | 0.0    | 0.0   | 0.0   |
| 210.0 TO 215.0 | 0.0    | 0.0   | 0.0   |
| 215.0 TO 220.0 | 0.0    | 0.0   | 0.0   |
| ENTRIES        | 1116   | 1080  | 1109  |

TABLE 6. Frequency distributions of path loss for S-band.

| DIFFERENCE     | % HIGH-LOW | % HIGH-MID | % MID-LOW |
|----------------|------------|------------|-----------|
| -20.0 TO -18.0 | 0.0        | 0.0        | 0.0       |
| -18.0 TO -16.0 | 0.0        | 0.0        | 0.0       |
| -16.0 TO -14.0 | 0.0        | 0.0        | 0.0       |
| -14.0 TO -12.0 | 0.0        | 0.0        | 0.0       |
| -12.0 TO -10.0 | 0.0        | 0.0        | 0.0       |
| -10.0 TO -8.0  | 0.0        | 0.0        | 0.0       |
| -8.0 TO -6.0   | 0.0        | 0.2        | 0.0       |
| -6.0 TO -4.0   | 0.1        | 0.0        | 0.1       |
| -4.0 TO -2.0   | 0.0        | 0.1        | 0.2       |
| -2.0 TO 0.0    | 0.0        | 0.1        | 0.8       |
| 0.0 TO 2.0     | 0.1        | 1.4        | 0.2       |
| 2.0 TO 4.0     | 0.5        | 20.3       | 9.0       |
| 4.0 TO 6.0     | 2.7        | 46.7       | 52.9      |
| 6.0 TO 8.0     | 11.0       | 28.2       | 32.5      |
| 8.0 TO 10.0    | 19.1       | 2.0        | 2.6       |
| 10.0 TO 12.0   | 38.9       | 0.8        | 0.3       |
| 12.0 TO 14.0   | 21.2       | 0.0        | 0.4       |
| 14.0 TO 16.0   | 4.3        | 0.0        | 0.3       |
| 16.0 TO 18.0   | 0.9        | 0.1        | 0.2       |
| 18.0 TO 20.0   | 1.3        | 0.1        | 0.5       |
| ENTRIES        | 1018       | 1010       | 998       |

TABLE 7.....Frequency distributions of path loss differences  
between antennas for S-band.

## S BAND, KEY WEST MAY 1972

| FADING  |      | % HIGH | % MID | % LOW |
|---------|------|--------|-------|-------|
| 0.0 TO  | 0.5  | 1.8    | 1.1   | 0.5   |
| 0.5 TO  | 1.0  | 14.8   | 8.2   | 6.9   |
| 1.0 TO  | 1.5  | 33.1   | 26.4  | 14.6  |
| 1.5 TO  | 2.0  | 27.9   | 33.0  | 31.7  |
| 2.0 TO  | 2.5  | 8.8    | 12.4  | 13.5  |
| 2.5 TO  | 3.0  | 10.8   | 11.5  | 10.6  |
| 3.0 TO  | 3.5  | 2.2    | 5.0   | 9.5   |
| 3.5 TO  | 4.0  | 0.4    | 1.4   | 5.7   |
| 4.0 TO  | 4.5  | 0.2    | 0.4   | 2.3   |
| 4.5 TO  | 5.0  | 0.0    | 0.1   | 0.8   |
| 5.0 TO  | 5.5  | 0.1    | 0.6   | 2.0   |
| 5.5 TO  | 6.0  | 0.0    | 0.0   | 0.8   |
| 6.0 TO  | 6.5  | 0.0    | 0.0   | 0.2   |
| 6.5 TO  | 7.0  | 0.0    | 0.0   | 0.0   |
| 7.0 TO  | 7.5  | 0.0    | 0.0   | 0.1   |
| 7.5 TO  | 8.0  | 0.0    | 0.0   | 0.1   |
| 8.0 TO  | 8.5  | 0.0    | 0.0   | 0.0   |
| 8.5 TO  | 9.0  | 0.0    | 0.0   | 0.0   |
| 9.0 TO  | 9.5  | 0.0    | 0.0   | 0.0   |
| 9.5 TO  | 10.0 | 0.0    | 0.0   | 0.7   |
| ENTRIES |      | 1116   | 1080  | 1109  |

TABLE 8. Frequency distributions of fading S-band.

## X BAND MARQUESS TO KEY WEST, FLORIDA MAY, 1972

| HIGH-LOW             | MID-LOW              | HIGH-MID             | FADING HIGH          | FADING MIDDLE        | FADING LOW           |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 0.2 % > 20.0 DB      | 0.0 % > 20.0 DB      | 0.0 % > 20.0 DB      | 0.0 % > 20.0 DB      | 0.0 % > 20.0 DB      | 0.0 % > 20.0 DB      |
| 1.5 % > 15.0 DB      | 0.1 % > 15.0 DB      | 0.0 % > 15.0 DB      | 0.3 % > 15.0 DB      | 0.0 % > 15.0 DB      | 0.2 % > 15.0 DB      |
| 9.4 % > 10.0 DB      | 0.1 % > 10.0 DB      | 0.6 % > 10.0 DB      | 2.7 % > 10.0 DB      | 0.2 % > 10.0 DB      | 0.3 % > 10.0 DB      |
| 22.6 % > 5.0 DB      | 0.2 % > 5.0 DB       | 9.9 % > 5.0 DB       | 3.5 % > 5.0 DB       | 0.5 % > 5.0 DB       | 0.7 % > 5.0 DB       |
| 30.8 % > 3.0 DB      | 17.4 % > 3.0 DB      | 26.7 % > 3.0 DB      | 19.4 % > 3.0 DB      | 2.3 % > 3.0 DB       | 1.5 % > 3.0 DB       |
| 38.6 % > 0.0 DB      | 37.6 % > 0.0 DB      | 39.3 % > 0.0 DB      | 23.5 % > 0.0 DB      | 4.2 % > 0.0 DB       | 2.9 % > 0.0 DB       |
| 43.6 % > -3.0 DB     | 50.6 % > -3.0 DB     | 57.8 % > -3.0 DB     | 23.5 % > 0.0 DB      | 13.8 % > 0.0 DB      | 9.9 % > 0.0 DB       |
| 49.7 % > -6.0 DB     | 73.2 % > -6.0 DB     | 74.7 % > -6.0 DB     | 49.7 % > -6.0 DB     | 36.8 % > 0.0 DB      | 33.5 % > 0.0 DB      |
| 62.9 % > -10.0 DB    | 92.8 % > -10.0 DB    | 91.3 % > -10.0 DB    | 62.9 % > -10.0 DB    | 60.4 % > 0.0 DB      | 51.3 % > 0.0 DB      |
| 84.9 % > -15.0 DB    | 99.2 % > -15.0 DB    | 98.4 % > -15.0 DB    | 84.9 % > -15.0 DB    | 92.6 % > 0.0 DB      | 90.8 % > 0.0 DB      |
| 96.1 % > -20.0 DB    | 99.9 % > -20.0 DB    | 100.0 % > -20.0 DB   | 96.1 % > -20.0 DB    | 99.9 % > 0.0 DB      | 90.8 % > 0.0 DB      |
| TOTAL ENTRIES = 1160 | TOTAL ENTRIES = 1165 | TOTAL ENTRIES = 1183 | TOTAL ENTRIES = 1174 | TOTAL ENTRIES = 1189 | TOTAL ENTRIES = 1189 |

TABLE 9. Statistical presentation for X-band.

## X BAND, KEY WEST MAY 1972

| PATH LOSS      | % HIGH | % MID | % LOW |
|----------------|--------|-------|-------|
| 120.0 TO 125.0 | 0.0    | 0.0   | 0.0   |
| 125.0 TO 130.0 | 0.0    | 0.0   | 0.0   |
| 130.0 TO 135.0 | 0.0    | 0.0   | 0.0   |
| 135.0 TO 140.0 | 0.0    | 0.0   | 0.0   |
| 140.0 TO 145.0 | 0.0    | 0.0   | 2.3   |
| 145.0 TO 150.0 | 0.0    | 1.1   | 27.1  |
| 150.0 TO 155.0 | 4.7    | 26.3  | 23.2  |
| 155.0 TO 160.0 | 27.2   | 25.4  | 9.9   |
| 160.0 TO 165.0 | 29.1   | 16.0  | 5.3   |
| 165.0 TO 170.0 | 26.5   | 12.6  | 8.4   |
| 170.0 TO 175.0 | 10.6   | 8.8   | 9.2   |
| 175.0 TO 180.0 | 2.0    | 4.9   | 5.5   |
| 180.0 TO 185.0 | 0.0    | 4.0   | 5.1   |
| 185.0 TO 190.0 | 0.0    | 0.9   | 2.6   |
| 190.0 TO 195.0 | 0.0    | 0.0   | 1.3   |
| 195.0 TO 200.0 | 0.0    | 0.0   | 0.1   |
| 200.0 TO 205.0 | 0.0    | 0.0   | 0.0   |
| 205.0 TO 210.0 | 0.0    | 0.0   | 0.0   |
| 210.0 TO 215.0 | 0.0    | 0.0   | 0.0   |
| 215.0 TO 220.0 | 0.0    | 0.0   | 0.0   |
| ENTRIES        | 1177   | 1172  | 1172  |

TABLE 10. Frequency distributions of path loss for X-band.

## X BAND, KEY WEST MAY 1972

| DIFFERENCE     | % HIGH-LOW | % HIGH-MID | % MID-LOW |
|----------------|------------|------------|-----------|
| -20.0 TO -18.0 | 7.1        | 0.3        | 0.4       |
| -18.0 TO -16.0 | 5.2        | 0.9        | 0.3       |
| -16.0 TO -14.0 | 6.6        | 1.5        | 0.4       |
| -14.0 TO -12.0 | 7.1        | 2.5        | 1.2       |
| -12.0 TO -10.0 | 11.0       | 3.8        | 4.5       |
| -10.0 TO -8.0  | 7.1        | 5.3        | 6.0       |
| -8.0 TO -6.0   | 5.3        | 10.1       | 10.9      |
| -6.0 TO -4.0   | 4.8        | 13.4       | 18.4      |
| -4.0 TO -2.0   | 2.8        | 9.8        | 11.2      |
| -2.0 TO 0.0    | 3.8        | 12.3       | 7.6       |
| 0.0 TO 2.0     | 3.7        | 8.1        | 12.7      |
| 2.0 TO 4.0     | 6.4        | 9.4        | 15.1      |
| 4.0 TO 6.0     | 5.8        | 12.1       | 8.0       |
| 6.0 TO 8.0     | 6.7        | 6.1        | 2.6       |
| 8.0 TO 10.0    | 6.9        | 3.4        | 0.6       |
| 10.0 TO 12.0   | 4.0        | 0.6        | 0.0       |
| 12.0 TO 14.0   | 3.0        | 0.1        | 0.0       |
| 14.0 TO 16.0   | 1.5        | 0.0        | 0.1       |
| 16.0 TO 18.0   | 0.6        | 0.0        | 0.0       |
| 18.0 TO 20.0   | 0.6        | 0.0        | 0.0       |
| ENTRIES        | 1163       | 1166       | 1156      |

TABLE 11. Frequency distributions of path loss differences between antennas for X-band.

## X BAND, KEY WEST MAY 1972

| FADING      | % HIGH | % MID | % LOW |
|-------------|--------|-------|-------|
| 0.0 TO 0.5  | 0.1    | 0.0   | 1.0   |
| 0.5 TO 1.0  | 4.3    | 3.5   | 7.8   |
| 1.0 TO 1.5  | 7.4    | 6.2   | 7.3   |
| 1.5 TO 2.0  | 23.3   | 27.6  | 32.1  |
| 2.0 TO 2.5  | 7.6    | 7.1   | 2.9   |
| 2.5 TO 3.0  | 7.3    | 16.5  | 12.5  |
| 3.0 TO 3.5  | 11.9   | 20.6  | 22.2  |
| 3.5 TO 4.0  | 2.8    | 3.3   | 2.6   |
| 4.0 TO 4.5  | 4.2    | 5.9   | 5.8   |
| 4.5 TO 5.0  | 6.3    | 2.9   | 0.9   |
| 5.0 TO 5.5  | 2.3    | 3.1   | 2.6   |
| 5.5 TO 6.0  | 2.0    | 0.7   | 0.5   |
| 6.0 TO 6.5  | 4.7    | 1.4   | 0.2   |
| 6.5 TO 7.0  | 3.4    | 0.2   | 0.8   |
| 7.0 TO 7.5  | 0.4    | 0.0   | 0.1   |
| 7.5 TO 8.0  | 2.0    | 0.3   | 0.0   |
| 8.0 TO 8.5  | 0.5    | 0.4   | 0.0   |
| 8.5 TO 9.0  | 0.7    | 0.0   | 0.1   |
| 9.0 TO 9.5  | 0.0    | 0.0   | 0.0   |
| 9.5 TO 10.0 | 4.0    | 0.3   | 0.5   |
| ENTRIES     | 1177   | 1172  | 1172  |

TABLE 12. Frequency distributions of fading X-band.



KU BAND, KEY WEST      MAY 1972 ..

| PATH LOSS      | % HIGH | % MID | % LOW |
|----------------|--------|-------|-------|
| 120.0 TO 125.0 | 0.0    | 0.0   | 0.0   |
| 125.0 TO 130.0 | 0.0    | 0.0   | 0.0   |
| 130.0 TO 135.0 | 0.0    | 0.0   | 0.0   |
| 135.0 TO 140.0 | 0.0    | 0.0   | 0.0   |
| 140.0 TO 145.0 | 0.0    | 0.0   | 8.5   |
| 145.0 TO 150.0 | 0.0    | 7.8   | 20.0  |
| 150.0 TO 155.0 | 10.7   | 22.5  | 20.8  |
| 155.0 TO 160.0 | 21.4   | 13.2  | 3.8   |
| 160.0 TO 165.0 | 25.0   | 18.6  | 26.9  |
| 165.0 TO 170.0 | 8.9    | 15.5  | 11.5  |
| 170.0 TO 175.0 | 11.6   | 7.8   | 3.8   |
| 175.0 TO 180.0 | 14.3   | 7.8   | 0.8   |
| 180.0 TO 185.0 | 8.0    | 6.2   | 0.8   |
| 185.0 TO 190.0 | 0.0    | 0.8   | 1.5   |
| 190.0 TO 195.0 | 0.0    | 0.0   | 1.5   |
| 195.0 TO 200.0 | 0.0    | 0.0   | 0.0   |
| 200.0 TO 205.0 | 0.0    | 0.0   | 0.0   |
| 205.0 TO 210.0 | 0.0    | 0.0   | 0.0   |
| 210.0 TO 215.0 | 0.0    | 0.0   | 0.0   |
| 215.0 TO 220.0 | 0.0    | 0.0   | 0.0   |
| ENTRIES        | 112    | 129   | 130   |

TABLE 14. Frequency distributions of path loss for Ku-band.

| DIFFERENCE     | % HIGH-LOW | % HIGH-MID | % MID-LOW |
|----------------|------------|------------|-----------|
| -20.0 TO -18.0 | 4.0        | 0.0        | 1.0       |
| -18.0 TO -16.0 | 11.1       | 0.0        | 0.0       |
| -16.0 TO -14.0 | 18.2       | 1.0        | 1.0       |
| -14.0 TO -12.0 | 9.1        | 0.0        | 3.0       |
| -12.0 TO -10.0 | 21.2       | 6.0        | 8.1       |
| -10.0 TO -8.0  | 4.0        | 16.0       | 14.1      |
| -8.0 TO -6.0   | 2.0        | 16.0       | 17.2      |
| -6.0 TO -4.0   | 2.0        | 13.0       | 14.1      |
| -4.0 TO -2.0   | 2.0        | 14.0       | 12.1      |
| -2.0 TO 0.0    | 3.0        | 9.0        | 5.1       |
| 0.0 TO 2.0     | 3.0        | 13.0       | 3.0       |
| 2.0 TO 4.0     | 2.0        | 6.0        | 5.1       |
| 4.0 TO 6.0     | 5.1        | 4.0        | 4.0       |
| 6.0 TO 8.0     | 3.0        | 0.0        | 7.1       |
| 8.0 TO 10.0    | 2.0        | 2.0        | 2.0       |
| 10.0 TO 12.0   | 2.0        | 0.0        | 1.0       |
| 12.0 TO 14.0   | 2.0        | 0.0        | 2.0       |
| 14.0 TO 16.0   | 1.0        | 0.0        | 0.0       |
| 16.0 TO 18.0   | 2.0        | 0.0        | 0.0       |
| 18.0 TO 20.0   | 1.0        | 0.0        | 0.0       |
| ENTRIES        | 99         | 100        | 99        |

TABLE 15. Frequency distributions of path loss differences between antennas for Ku-band.

## KU BAND, KEY WEST      MAY 1972

| FADING  |      | % HIGH | % MID | % LOW |
|---------|------|--------|-------|-------|
| 0.0 TO  | 0.5  | 0.0    | 0.0   | 0.0   |
| 0.5 TO  | 1.0  | 0.0    | 0.0   | 0.0   |
| 1.0 TO  | 1.5  | 0.9    | 0.0   | 7.7   |
| 1.5 TO  | 2.0  | 0.0    | 0.8   | 0.8   |
| 2.0 TO  | 2.5  | 6.3    | 8.5   | 6.9   |
| 2.5 TO  | 3.0  | 6.3    | 6.2   | 10.8  |
| 3.0 TO  | 3.5  | 6.3    | 6.2   | 12.3  |
| 3.5 TO  | 4.0  | 4.5    | 7.8   | 15.4  |
| 4.0 TO  | 4.5  | 17.9   | 20.2  | 5.4   |
| 4.5 TO  | 5.0  | 1.8    | 3.9   | 1.5   |
| 5.0 TO  | 5.5  | 3.6    | 10.1  | 8.5   |
| 5.5 TO  | 6.0  | 1.8    | 3.9   | 10.0  |
| 6.0 TO  | 6.5  | 17.9   | 16.3  | 4.6   |
| 6.5 TO  | 7.0  | 15.2   | 6.2   | 1.5   |
| 7.0 TO  | 7.5  | 0.0    | 0.0   | 0.0   |
| 7.5 TO  | 8.0  | 0.0    | 0.0   | 3.1   |
| 8.0 TO  | 8.5  | 1.8    | 0.3   | 0.0   |
| 8.5 TO  | 9.0  | 0.0    | 0.0   | 2.3   |
| 9.0 TO  | 9.5  | 0.9    | 0.0   | 0.0   |
| 9.5 TO  | 10.0 | 15.2   | 9.3   | 9.2   |
| ENTRIES |      | 112    | 129   | 130   |

TABLE 16. Frequency distributions of fading Ku-band.

## X. APPENDIX

Climatological data for Key West, 1972.



# LOCAL CLIMATOLOGICAL DATA

## ANNUAL SUMMARY WITH COMPARATIVE DATA

### KEY WEST, FLORIDA

1972

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
ENVIRONMENTAL DATA SERVICE

## NARRATIVE CLIMATOLOGICAL SUMMARY

Key West is located at the end of the Overseas Highway and near the western end of the Florida Keys, which are a chain of islands swinging in a southwesterly arc from the southeast coast of the Florida peninsula. The nearest point on the mainland is about 60 statute miles to the northeast, while Cuba at its closest point is 98 miles south. The City occupies the island of the same name which is 3-1/2 miles long (ENE-WSW) and 1 mile wide. Its mean elevation is around 8 feet. The maximum elevation of 18 feet covers only about one acre in the western portion. Soil is a thin layer of sand, or marlfill, overlying a stratum of Oolitic limestone. Vegetation on the eastern end of the island is scanty, chiefly of low growth. The western end, where settlement and landscaping are older, has a little heavier growth. The airport and WBAS are located on the southeast shore on partially filled mangrove swamp.

The waters surrounding the key are quite shallow up to the mainland on the northeast and for 6 miles to the reef on the south. There is little wave action because the reef disrupts any established wave pattern.

Because of the nearness of the Gulf Stream in the Straits of Florida, about 12 miles south and

southeast, and the tempering effects of the Gulf of Mexico to the west and north, Key West has a notably mild, tropical-maritime climate in which the average temperatures during the winter are only about 14° lower than in summer. Cold fronts are strongly modified by the warm water as they move in from northerly quadrants in winter. There is no known record of frost, ice, sleet, or snow in Key West. Prevailing easterly tradewinds and sea breezes suppress the usual summertime heating. Diurnal variations throughout the year average only about 10°.

Precipitation is characterized by dry and wet seasons. The period of December through April receives abundant sunshine and slightly less than 25 percent of the annual rainfall. This rainfall usually occurs in advance of cold fronts in a few heavy showers, or occasionally 5 - 8 light showers per month. June through October is normally the wet season, receiving approximately 53 percent of the yearly total in numerous showers and thunderstorms. Early morning is the favored time for diurnal showers. Easterly waves during this season occasionally bring excessive rainfall, while infrequent hurricanes may be accompanied by unusually heavy amounts. Humidity remains relatively high during the entire year.

## METEOROLOGICAL DATA FOR THE CURRENT YEAR

[illegible]

**NORMALS, MEANS, AND EXTREMES** — BASED ON RECORDS FROM AIRPORT LOCATIONS FOR 1-1-65 TO 6-30-65 AND 7-1-57 TO DATE

[illegible]

Means and extremes above are from calculating and comparable exposures. Annual extremes have been recorded at other sites in the locality as follows. Hottest temperature 97 in August 1956, lowest temperature 41 in January 1966, maximum monthly precipitation 23.56 in October 1933; maximum precipitation in 24 hrs. 19.28 in November 1935.

a) length of second year, based on January data.  
 (major mistake may be for more or fewer years if there are been breaks in the record)

b) (Hesselt had standard records 1931-1960).

1. Also on earlier date, month, or year.  
2. Table, shown too small in newspaper.  
3. The accompanying are provided by a newspaper.  
4. The prevailing direction for wind in the formula.  
5. A wind and barometer table is from records through  
6. 1907.

- 74° et 14° han stations

## AVERAGE TEMPERATURE

| Year   | Jan. | Feb. | Mar. | Apr. | May  | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|--------|------|------|------|------|------|------|------|------|-------|------|------|------|--------|
| 1933   | 72.0 | 74.4 | 73.8 | 76.6 | 81.8 | 85.8 | 84.3 | 83.4 | 82.8  | 78.9 | 72.2 | 72.4 | 77.9   |
| 1934   | 71.4 | 70.4 | 73.2 | 77.0 | 86.2 | 82.8 | 82.4 | 82.4 | 82.4  | 78.4 | 71.0 | 71.0 | 77.5   |
| 1935   | 69.7 | 69.3 | 73.2 | 78.4 | 82.1 | 83.8 | 82.8 | 84.0 | 82.4  | 79.1 | 73.8 | 69.7 | 77.2   |
| 1936   | 71.0 | 70.4 | 71.8 | 76.7 | 78.6 | 81.2 | 82.2 | 83.0 | 83.0  | 81.4 | 73.2 | 73.4 | 77.4   |
| 1937   | 77.0 | 72.6 | 72.6 | 76.8 | 78.8 | 82.0 | 82.4 | 82.8 | 82.2  | 78.8 | 72.6 | 68.6 | 77.4   |
| 1938   | 69.4 | 72.1 | 75.4 | 76.8 | 80.8 | 82.2 | 83.4 | 83.8 | 82.8  | 76.4 | 70.4 | 70.4 | 77.7   |
| 1939   | 71.8 | 73.4 | 76.4 | 76.8 | 79.5 | 82.3 | 83.4 | 82.2 | 83.1  | 80.2 | 72.4 | 69.4 | 77.9   |
| 1940   | 69.4 | 66.2 | 71.0 | 76.4 | 78.1 | 83.2 | 84.4 | 83.9 | 81.4  | 77.8 | 74.4 | 73.8 | 76.2   |
| 1941   | 69.4 | 66.8 | 69.4 | 73.1 | 78.0 | 82.2 | 84.2 | 85.0 | 83.1  | 81.6 | 76.3 | 75.1 | 77.3   |
| 1942   | 68.8 | 66.8 | 72.2 | 75.0 | 79.9 | 82.4 | 84.8 | 83.4 | 83.4  | 79.8 | 76.0 | 73.4 | 77.5   |
| 1943   | 72.5 | 68.8 | 73.4 | 75.4 | 80.4 | 82.9 | 85.0 | 84.8 | 83.4  | 78.2 | 73.2 | 69.9 | 77.4   |
| 1944   | 67.6 | 73.8 | 76.1 | 78.4 | 78.8 | 84.0 | 85.3 | 85.1 | 84.2  | 77.8 | 73.4 | 68.0 | 77.7   |
| 1945   | 69.4 | 73.1 | 77.2 | 76.9 | 79.6 | 83.2 | 83.4 | 83.5 | 82.4  | 79.5 | 72.9 | 70.4 | 77.9   |
| 1946   | 71.4 | 73.2 | 73.0 | 77.9 | 82.0 | 81.4 | 84.2 | 84.0 | 83.2  | 79.4 | 76.4 | 74.4 | 78.8   |
| 1947   | 75.5 | 67.5 | 71.2 | 80.3 | 80.6 | 82.6 | 82.9 | 83.4 | 82.5  | 79.0 | 78.5 | 73.8 | 78.2   |
| 1948   | 69.4 | 74.2 | 78.2 | 77.2 | 80.8 | 82.7 | 84.0 | 84.9 | 82.7  | 79.8 | 76.8 | 76.0 | 79.3   |
| 1949   | 73.5 | 76.2 | 74.0 | 76.4 | 80.4 | 82.8 | 83.5 | 83.7 | 82.9  | 80.4 | 72.3 | 72.7 | 78.5   |
| 1950   | 74.8 | 72.7 | 74.5 | 74.3 | 81.5 | 84.9 | 84.5 | 84.0 | 82.5  | 80.4 | 73.5 | 68.9 | 78.0   |
| 1951   | 68.3 | 68.5 | 74.2 | 76.7 | 80.3 | 83.7 | 84.4 | 84.3 | 83.3  | 80.3 | 74.1 | 73.4 | 78.1   |
| 1952   | 72.9 | 70.5 | 73.4 | 78.4 | 81.0 | 83.3 | 84.5 | 83.2 | 83.2  | 79.4 | 75.2 | 69.2 | 79.1   |
| 1953   | 67.7 | 72.2 | 76.3 | 78.8 | 82.3 | 81.3 | 82.8 | 84.4 | 85.4  | 77.4 | 74.4 | 72.4 | 78.1   |
| 1954   | 71.4 | 71.1 | 71.4 | 75.6 | 80.1 | 82.9 | 84.3 | 84.4 | 82.9  | 78.5 | 73.3 | 68.4 | 77.3   |
| 1955   | 68.2 | 70.4 | 73.7 | 78.3 | 81.1 | 82.7 | 83.0 | 84.5 | 83.9  | 78.5 | 75.4 | 71.3 | 77.8   |
| 1956   | 67.9 | 74.4 | 76.1 | 78.7 | 81.9 | 82.4 | 84.6 | 84.6 | 82.0  | 78.9 | 72.7 | 73.8 | 78.2   |
| 1957   | 72.7 | 74.9 | 76.1 | 78.2 | 80.4 | 82.6 | 84.1 | 85.7 | 82.0  | 78.5 | 77.5 | 68.4 | 78.9   |
| 1958   | 65.3 | 63.5 | 70.4 | 75.6 | 78.6 | 82.6 | 84.5 | 85.2 | 83.1  | 78.9 | 76.9 | 71.1 | 76.5   |
| 1959   | 68.5 | 77.1 | 73.3 | 76.9 | 80.1 | 82.4 | 83.1 | 83.4 | 82.5  | 78.5 | 76.8 | 67.7 | 77.0   |
| 1960   | 70.4 | 68.4 | 68.8 | 68.8 | 74.0 | 79.0 | 82.4 | 85.3 | 82.7  | 82.2 | 76.8 | 67.5 | 77.0   |
| 1961   | 67.0 | 71.8 | 73.7 | 75.4 | 80.5 | 82.4 | 84.9 | 85.0 | 83.0  | 79.3 | 76.3 | 72.5 | 77.9   |
| 1962   | 69.8 | 73.7 | 75.7 | 78.7 | 79.5 | 82.8 | 84.8 | 84.5 | 83.1  | 80.6 | 71.4 | 67.2 | 77.4   |
| 1963   | 70.2 | 68.9 | 75.4 | 76.8 | 79.4 | 83.4 | 84.9 | 85.0 | 83.4  | 78.4 | 74.0 | 66.7 | 77.3   |
| 1964   | 68.9 | 67.7 | 75.9 | 78.7 | 80.4 | 83.0 | 84.4 | 84.9 | 83.4  | 78.3 | 77.0 | 73.8 | 78.1   |
| 1965   | 71.3 | 73.2 | 76.4 | 80.3 | 81.5 | 84.1 | 85.2 | 85.1 | 83.2  | 80.2 | 76.4 | 71.9 | 79.3   |
| 1966   | 69.1 | 69.1 | 70.9 | 75.3 | 79.7 | 79.8 | 83.0 | 84.1 | 83.3  | 79.4 | 73.0 | 69.4 | 76.3   |
| 1967   | 72.7 | 71.4 | 75.9 | 78.1 | 82.4 | 84.2 | 84.8 | 84.5 | 83.1  | 79.7 | 73.1 | 67.4 | 78.2   |
| 1968   | 71.7 | 68.3 | 70.8 | 76.7 | 81.7 | 83.7 | 83.1 | 83.1 | 81.1  | 76.4 | 72.9 | 69.0 | 76.9   |
| 1969   | 70.2 | 68.2 | 68.9 | 77.4 | 80.6 | 82.7 | 83.3 | 84.9 | 83.0  | 80.3 | 72.4 | 69.2 | 77.0   |
| 1970   | 67.0 | 67.0 | 72.9 | 76.9 | 78.9 | 82.9 | 83.3 | 81.4 | 82.7  | 73.9 | 71.9 | 62.4 | 76.0   |
| 1971   | 70.4 | 71.9 | 72.4 | 75.9 | 80.7 | 83.0 | 84.1 | 83.2 | 82.7  | 81.1 | 75.8 | 76.2 | 78.2   |
| 1972   | 75.2 | 71.9 | 73.4 | 77.9 | 80.9 | 81.3 | 83.4 | 84.4 | 82.9  | 81.3 | 78.0 | 73.4 | 78.9   |
| RECORD | 70.3 | 70.9 | 73.3 | 76.3 | 79.7 | 82.4 | 83.8 | 83.9 | 82.4  | 79.4 | 74.0 | 70.9 | 77.3   |
| MEAN   | 74.8 | 75.9 | 78.3 | 81.5 | 84.6 | 87.4 | 89.0 | 89.2 | 87.8  | 83.7 | 78.4 | 73.4 | 82.2   |
| MIN    | 63.2 | 65.9 | 68.3 | 71.9 | 74.7 | 77.3 | 78.4 | 78.5 | 77.4  | 70.2 | 66.2 | 72.4 |        |

## TOTAL DEGREE DAYS

KEY WEST, FLORIDA

| Season  | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Total |
|---------|------|------|-------|------|------|------|------|------|------|------|-----|------|-------|
| 1933-34 | 0    | 0    | 0     | 0    | 0    | 0    | 32   | 17   | 0    | 0    | 0   | 0    | 79    |
| 1934-35 | 0    | 0    | 0     | 0    | 0    | 0    | 40   | 16   | 6    | 0    | 0   | 0    | 72    |
| 1935-36 | 0    | 0    | 0     | 0    | 0    | 0    | 32   | 23   | 2    | 0    | 0   | 0    | 65    |
| 1936-37 | 0    | 0    | 0     | 0    | 0    | 0    | 2    | 4    | 3    | 0    | 0   | 0    | 12    |
| 1937-38 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1938-39 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1939-40 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1940-41 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1941-42 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1942-43 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1943-44 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1944-45 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1945-46 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1946-47 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1947-48 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1948-49 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1949-50 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1950-51 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1951-52 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1952-53 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1953-54 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1954-55 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1955-56 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1956-57 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1957-58 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1958-59 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1959-60 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1960-61 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1961-62 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1962-63 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1963-64 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1964-65 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1965-66 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1966-67 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1967-68 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1968-69 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1969-70 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1970-71 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1971-72 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |
| 1972-73 | 0    | 0    | 0     | 0    | 0    | 0    | 1    | 1    | 2    | 0    | 0   | 0    | 12    |

## TOTAL PRECIPITATION

| Year   | Jan. | Feb.  | Mar. | Apr.  | May   | June  | July  | Aug.  | Sept. | Oct.  | Nov.  | Dec.  | Annual |
|--------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 1933   | 0.28 | 0.73  | 0.39 | 0.59  | 1.47  | 10.91 | 3.30  | 4.90  | 3.12  | 23.36 | 3.79  | 1.37  | 52.02  |
| 1934   | 1.13 | 0.93  | 0.99 | 0.70  | 2.88  | 3.38  | 2.24  | 6.72  | 3.01  | 2.12  | 0.41  | 31.50 |        |
| 1935   | 1.91 | 0.43  | 0.39 | 1.04  | 3.50  | 2.68  | 10.38 | 4.16  | 9.49  | 2.21  | 9.14  | 3.98  | 39.62  |
| 1936   | 2.39 | 0.48  | 0.36 | 1.02  | 3.31  | 10.48 | 4.08  | 7.32  | 5.16  | 3.80  | 1.36  | 1.67  | 50.46  |
| 1937   | 0.84 | 3.30  | 1.18 | 0.13  | 0.63  | 0.00  | 0.11  | 0.34  | 0.01  | 0.39  | 1.28  | 0.82  | 6.29   |
| 1938   | 0.30 | 0.29  | 1.30 | 0.81  | 1.24  | 3.33  | 3.29  | 2.16  | 3.72  | 2.65  | 3.23  | 0.24  | 22.58  |
| 1939   | 1.79 | 2.49  | 0.30 | 7.48  | 2.71  | 1.97  | 3.39  | 3.79  | 3.19  | 11.63 | 0.13  | 7.70  | 42.12  |
| 1940   | 2.82 | 1.38  | 2.72 | 1.49  | 1.93  | 1.10  | 4.59  | 5.79  | 1.88  | 1.66  | 2.76  | 8.29  | 41.50  |
| 1941   | 1.17 | 0.24  | 3.12 | 1.14  | 0.14  | 1.82  | 3.11  | 2.57  | 4.99  | 4.72  | 7.59  | 3.46  | 52.31  |
| 1942   | 2.30 | 0.40  | 2.74 | 0.19  | 1.57  | 0.43  | 3.33  | 1.33  | 2.79  | 3.95  | 1.74  | 0.76  | 29.53  |
| 1943   | 0.71 | 0.39  | 2.68 | 1.33  | 1.71  | 0.64  | 1.72  | 2.56  | 0.35  | 7.95  | 6.20  | 2.99  | 36.33  |
| 1944   | 0.69 | 1     | 2.01 | 0.75  | 3.24  | 1.34  | 3.38  | 3.25  | 0.60  | 7.50  | 3.29  | 1.88  | 31.93  |
| 1945   | 0.34 | 0.09  | 3.34 | 1.14  | 0.04  | 3.67  | 0.39  | 0.62  | 0.34  | 8.24  | 3.63  | 1.19  | 40.93  |
| 1946   | 0.88 | 0.29  | 0.84 | 1.37  | 2.05  | 6.70  | 3.62  | 2.96  | 3.44  | 4.02  | 1.02  | 1.31  | 31.68  |
| 1947   | 0.77 | 0.17  | 3.06 | 1.17  | 0.35  | 0.31  | 3.84  | 3.89  | 6.72  | 12.46 | 2.91  | 3.46  | 58.51  |
| 1948   | 0.12 | 0.37  | 1.87 | 12.63 | 0.88  | 1.90  | 5.61  | 2.73  | 13.84 | 3.74  | 3.31  | 3.05  | 49.17  |
| 1949   | 0.39 | 0.86  | 0.41 | 1.68  | 1.01  | 0.88  | 4.98  | 4.23  | 6.46  | 3.68  | 2.30  | 1.99  | 33.34  |
| 1950   | 0.36 | 1.81  | 1.73 | 2.33  | 1.10  | 0.22  | 2.83  | 7.59  | 9.56  | 6.29  | 2.54  | 1.95  | 36.87  |
| 1951   | 0.27 | 1.77  | 0.24 | 2.30  | 0.36  | 1.62  | 3.48  | 1.24  | 2.46  | 3.82  | 3.68  | 1.12  | 23.94  |
| 1952   | 0.52 | 1.23  | 0.47 | 2.47  | 0.74  | 3.58  | 0.59  | 2.46  | 4.26  | 7.39  | 0.69  | 0.67  | 32.67  |
| 1953   | 0.70 | 0.89  | 0.72 | 0.47  | 2.27  | 0.65  | 0.68  | 1.69  | 12.27 | 8.22  | 0.73  | 0.54  | 46.39  |
| 1954   | 0.33 | 0.24  | 2.90 | 0.63  | 2.94  | 3.28  | 1.28  | 5.12  | 3.79  | 13.99 | 20.98 | 1.61  | 56.85  |
| 1955   | 0.95 | 0.59  | 0.63 | 0.35  | 0.46  | 0.13  | 2.71  | 6.76  | 0.25  | 2.23  | 0.63  | 1.09  | 24.11  |
| 1956   | 0.27 | 1.50  | 0.31 | 0.12  | 2.82  | 1.85  | 3.62  | 1.24  | 11.19 | 0.87  | 0.22  | 0.18  | 20.46  |
| 1957   | 0.35 | 0.94  | 2.37 | 0.67  | 5.83  | 0.65  | 3.95  | 3.77  | 9.08  | 7.18  | 0.20  | 2.26  | 36.88  |
| 1958   | 7.9  | 2.13  | 4.11 | 3.37  | 2.63  | 2.78  | 3.11  | 10.20 | 7.59  | 0.05  | 1.19  | 3.70  | 45.81  |
| 1959   | 0.92 | 0.34  | 2.44 | 0.07  | 2.32  | 1.17  | 4.13  | 2.61  | 8.50  | 2.45  | 9.01  | 4.46  | 42.67  |
| 1960   | 0.53 | 1.94  | 1.21 | -0.02 | 12.90 | 2.18  | 3.79  | 9.21  | 9.12  | 3.78  | 0.63  | 0.98  | 46.76  |
| 1961   | 1.25 | -0.27 | 1.81 | 1.79  | 2.37  | 3.60  | 3.54  | 2.67  | 1.71  | 2.76  | 3.18  | 0.78  | 22.53  |
| 1962   | 0.94 | -0.46 | 0.91 | 0.92  | 1.19  | 1.10  | 1.30  | 1.93  | 7.22  | 0.88  | 1.20  | 0.48  | 36.49  |
| 1963   | 2.89 | 1.77  | 3.03 | 3.23  | 1.41  | 1.29  | 0.55  | 15.18 | 0.95  | 1.82  | 0.14  | 1.36  | 47.27  |
| 1964   | 0.26 | 0.81  | 1.67 | 0.63  | 0.96  | 3.42  | 2.2   | 1.68  | 3.42  | 0.0   | 3.19  | 1.09  | 29.36  |
| 1965   | 0.35 | -0.06 | 0.37 | 0.64  | 0.69  | 2.08  | 2.94  | 3.26  | 10.59 | 6.47  | 4.66  | 1.05  | 33.13  |
| 1966   | 0.31 | 3.24  | 1.33 | 2.15  | 1.77  | 13.67 | 5.88  | 3.50  | 8.36  | 7.12  | 0.71  | 1.38  | 53.62  |
| 1967   | 0.74 | 0.79  | 0.25 | 0.81  | 1.37  | 3.39  | 3.39  | 3.98  | 9.03  | 1.14  | 1.20  | 0.48  | 36.48  |
| 1968   | 0.57 | 3.64  | 0.36 | 3.25  | 3.02  | 16.36 | 6.11  | 7.77  | 6.70  | 4.40  | 0.92  | 1.18  | 51.88  |
| 1969   | 1.35 | 3.24  | 2.63 | 1.23  | 1.22  | 7.96  | 4.19  | 2.25  | 10.21 | 21.37 | 1.50  | 0.79  | 52.72  |
| 1970   | 0.21 | 2.10  | 2.20 | 0.21  | 2.63  | 1.78  | 11.09 | 0.03  | 3.39  | 6.03  | 0.13  | 0.36  | 46.82  |
| 1971   | 3.11 | 2.78  | 9    | 0.24  | 0.37  | 2.77  | 4.80  | 9.33  | 5.47  | 11.12 | 1.69  | 1.36  | 44.25  |
| 1972   | 2.73 | 2.04  | 0.39 | 0.74  | 2.84  | 14.78 | 6.84  | 3.53  | 8.70  | 7.74  | 2.04  | 1.36  | 46.28  |
| RECORD |      |       |      |       |       |       |       |       |       |       |       |       |        |
| 1973   | 1.09 | 1.88  | 1.43 | 1.80  | 2.49  | 0.06  | 3.69  | 4.48  | 6.88  | 5.89  | 2.29  | 1.76  | 38.32  |

## STATION LOCATION

KEY WEST, FLORIDA

| Location   | Occupied from | Occupied to | Airline distance and direction from previous location   | Latitude North | Longitude West | Elevation above |                            |                  |                     |              |                  |                          |                    | Remarks  |           |
|--|---------------|-------------|---|----------------|----------------|-----------------|----------------------------|------------------|---------------------|--------------|------------------|--------------------------|--------------------|--|-----------|
|  |               |             |   |                |                | Sea level       | Ground                     |                  |                     |              |                  |                          |                    |  | Sea level |
|  |               |             |   |                |                |                 | Ground at temperature site | Wind instruments | Extreme thermometer | Psychrometer | Telepsychrometer | Tipping bucket rain gage | Weighing rain gage |  |           |
| CITY   |               |             |   |                |                |                 |                            |                  |                     |              |                  |                          |                    |  |           |
| Russell House, West Side Duval Street, between Front & Green Streets                 | 11/01/70      | 11/30/70    |   | 24° 33'        | 81° 48'        | 3               |                            |                  |                     |              |                  |                          |                    | Station established window shelter   |           |
| Tift & Co. Building  | 12.01/70      | 7/31/71     | 2 blocks N  | 24° 33'        | 81° 48'        | 2               |                            | 16               |                     |              |                  |                          |                    | Window shelter.  |           |
| Duval Street between Front & Caroline  | 8.01.71       | 2/28/72     | 2 blocks S  | 24° 33'        | 81° 48'        | 3               |                            | 16               |                     |              |                  |                          |                    | Window shelter.  |           |
| Louvre Hotel, South side Front between Duval & Fitzpatrick                           | 3/01/72       | 2/28/82     | 1 block W   | 24° 33'        | 81° 48'        | 3               | 36                         | 43               | 42                  |              | 53               |                          |                    |  |           |
| Wall Building North side Front   | 3/01/82       | 3/30/86     | across St.  | 24° 33'        | 81° 48'        | 2               | 58                         | 20               | 20                  |              | 42               |                          |                    | Fire destroyed office with city 3/30/86.   |           |
| U. S. Naval Depot Building #1  | 4/12/86       | 12/31/86    | 2 blocks W  | 24° 33'        | 81° 48'        | 5               | 60                         | 48               | 46                  |              | 56               |                          |                    | * Poor exposure. Shelter on side of cupola type.   |           |
|  |               |             | ventilator for ware room storing several thousand bales of tobacco. Maxima of 100° in June, July, and August 1888 regarded as too high. |                |                |                 |                            |                  |                     |              |                  |                          |                    |  |           |
| Watts Building (Pierce Building) at Duval & Front                                    | 1/01/87       | 5/22/87     | 2 blocks E  | 24° 33'        | 81° 48'        | 2               | 30                         | 42               | 41                  |              | 46               |                          |                    |  |           |
| Weather Bureau Building Front & Eaton  | 5/23/03       | 9/30/11     | 600 yds. E  | 24° 33'        | 81° 48'        | 6               | 53                         | 11               | 11                  |              | 3                |                          |                    | Building damaged by 1909 and 1910 storms.  |           |
| Island City Bank Bldg 205 Duval Street   | 10/01/11      | 1/22/12     | 500 yds NE  | 24° 33'        | 81° 48'        | 3               | 50                         | 41               | 41                  |              | 32               |                          |                    | Location while new observatory being built.  |           |
| Weather Bureau Building Front & Eaton  | 1/23/13       | 3/28/30     | 500 yds. W  | 24° 33'        | 81° 48'        | 6               | 64                         | 10               | 10                  |              | 5                |                          |                    |  |           |
| U. S. Post Office Bldg. Situated on airline Streets                                  | 3/29/30       | 9/03/82     | 700 yds ESE   | 24° 33'        | 81° 48'        | 9               | 35                         | 5                | 5                   |              | 40               |                          |                    | Reduced to hurricane standby and climatological status 7/37  |           |
| AIRPORT  |               |             |   |                |                |                 |                            |                  |                     |              |                  |                          |                    |  |           |
| Eastern end of Key West Island Airways Station Building, 4 miles east of Post Office | 8/24/31       | 11/02/42    |   | 24° 34'        | 81° 45'        | 1               | 30                         | 4                | 4                   |              |                  |                          | 2                  | Operated by Airways Dept. of Lighthouse Service, Department of Commerce until 1/23/37  |           |
| Boys Chica Airport, 8 miles E. of P. O. on U. S. Highway 13 CIA Building             | 11/01/42      | 3/09/44     | 4 miles E   | 24° 33'        | 81° 42'        | 5               | 26                         | 5                | 5                   |              |                  |                          | 3                  |  |           |
| Boys Chica Airport, 1st Floor Operations Bldg.                                       | 3/09/44       | 6/22/44     | 100 yds. W  | 24° 33'        | 81° 42'        | 6               | 76                         | 5                | 5                   |              |                  |                          | 1                  | CIA Personnel and one Weather Bureau employee  |           |
| Boys Chica Airport 2nd Floor, Operations Building above CIA                          | 6/22/44       | 6/20/52     | Immediate above   | 24° 33'        | 81° 42'        | 6               | 76                         | 19               | 16                  |              |                  |                          | 15                 | Airport Station with full complement established. Consolidated at WFO 6/30/53.   |           |
| Key West International Airport   | 7/31/57       | 3/01/58     | 3 miles E of P. O.  | 24° 33'        | 81° 45'        | 5               | 30                         | 24               | 24                  |              |                  | 21                       | 21                 | Airport Station re-established 7/37.   |           |
| Key West International Airport   | 3/01/58       | Present     | Not moved   | 24° 33'        | 81° 45'        | 4               | 223                        | 18               | 18                  |              |                  | 15                       | 17                 | a - 25 feet to 63.64<br>b - Commissioned 350 feet NW of thermometer site 7/1/64.<br>c - 5 feet to 71.64<br>d - Removed March 1971. |           |

Requests for additional information should be directed to the National Weather Service Office for which this summary was issued.

Sale Price: 15 cents per copy. Checks and money orders should be made payable to Department of Commerce, NOAA. Remittances and correspondence regarding this publication should be sent to: National Climatic Center, Federal Building, Asheville, N. C. 28801. Attn: Publications.

NOAA-ASHEVILLE - 1990

U.S. DEPARTMENT OF COMMERCE  
NATIONAL CLIMATIC CENTER  
FEDERAL BUILDING  
ASHEVILLE, N. C. 28801

POSTAGE AND FEES PAID  
U.S. DEPARTMENT OF COMMERCE

210



FIRST CLASS

## XI. ACKNOWLEDGEMENT

The measurement program and the data analysis described in this report involved many people. The conscientious effort and enthusiasm of the following people was essential for the successful outcome of the project:

K. D. Anderson, M. L. Fontenot, L. J. Goodson, W. K. Horner, Dr. D. R. Jensen, and M. L. Phares.